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Railway Age

Vol. 85, No. 5 *August 4, 1928*

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Yard Costs

THE practice of putting daily cost figures in the hands of every yardmaster is gaining favor on the railways, and it is well that it should, for where this system is used, beneficial results have ensued. Not the least of its benefits is the opportunity for comparisons that it affords with other yards. In view of variations in the size of yards and in the amount and character of traffic handled, there are few terminals that are exactly comparable in all respects from a cost standpoint. However, there are certain elements that are comparable in many yards. The general yardmaster of the Oregon Short Line has worked out a formula for the division of yard expense, which, it is claimed, may be applied to any yard, regardless of size, and will show just what factors of expense are out of line. Some such formula may be worked out on any railway, and, when used in conjunction with daily yard costs, it should prove valuable in controlling expenses. Such a statistical line-up is of benefit to the individual yardmaster in controlling his yard and should also be of aid to operating officers having jurisdiction over several yards.

The Valuable Mr. Y

A RAILROAD traffic executive, in introducing a staff officer not long ago, spoke about as follows: "Mr. X, I want to make you acquainted with our Mr. Y. Mr. Y is the man who, after our traffic department has worked up a nice line of business, comes around and tells us that we are losing $1 a ton on all we handle" Mr. Y's services are most valuable to the railroad. From what producing region should the A. & B. division get its coal? Are limited trains Nos. 99 and 100 earning any money? Should authority be sought to abandon such and such a branch line? These and similar problems, Mr. Y has put to him regularly by the management and, with the aid of his staff, he answers them greatly to the profit of his company. The differences between cost studies of this kind and a complex and continuous system of "cost accounting" are two: first, the cost studies answer the questions about which knowledge is actually needed, instead of giving a multitude of figures, only a few of which are of any practical value; second, every cent spent on special studies, since they are made with a specific purpose, may be expected to produce a return by effecting the establishment of policy along lines of greatest efficiency. Mr. Y's services are indispensable and no system of "cost accounting," however expensive and complex it may be, will answer the questions which railroad managements will have to put to him and to others who do similar work.

A Joint Railway Advertising Campaign

IN competing for passenger business the railroads have a joint problem as well as an individual one. Before a prospective passenger can be induced to buy a ticket on the X. Y. & Z. Railroad rather than some other line, he must; first, be convinced that he should travel rather than spend his funds for something else; and, second, he must be induced to make his journey by rail rather than by water or highway. After the prospective passenger has been brought to this point, and not before, it then becomes possible for the railroads to compete with each other for his favor. The British railways, recognizing a joint problem in this situation, have combined to meet it and have embarked upon an extensive newspaper advertising campaign to merchandise railway service in general—as distinguished from that of the individual railway. The advertisements used, samples of which are shown in a recent issue of the Railway Gazette (London), emphasize the low rates which all the railways provide for week-end, special party, excursion and other services, pointing out also the pleasures of travel as compared with staying at home, and stressing the advantages of rail over other forms of transportation. Does not the method being used by British railways suggest that something similar might be done with advantage by American railways?

Using "19" Orders With Safety

THE advantage of the Form 19 order in place of the Form 31 is becoming more widely recognized as a means of reducing the number of train stops and attendant delays in handling train orders. In many cases at least 20 minutes delay is occasioned by stopping a long freight train to deliver a Form 31 order, which, if in the form of a 19 order, could have been delivered to the train without stopping it. However, not a few railway officers have had sad experience with mistakes being made in the transmission, delivery or observance of train orders, and, therefore, insist on using Form 31 orders to restrict rights while also maintaining strict manual blocking between trains. With the increasing traffic on many single-track lines, officers have been forced to seek methods that will reduce delays and increase track capacity. The adoption of the Form 19 order, and the unlimited use of the caution card to permit following trains in the same block, will often secure the desired result, as long as there are no errors in the handling of orders. The Norfolk & Western did not choose to take any chances on its single-track division from Cincinnati, Ohio, to Portsmouth, but, when the manual block system failed to provide the capacity and average speed desired, a system of automatic signals was installed, and with this protection

against accidents in case of an error in the handling of train orders, the Form 31 was superseded by the Form 19 for directing train movements. Delays were reduced to such an extent that the average running time of through freight trains was shortened one hour and forty-four minutes, most of which was in overtime, as described in detail in an article elsewhere in this issue. This is one of the most clean-cut illustrations of the benefits of automatic signals that it has been our opportunity to present for some time. It should be of interest especially to those roads that are facing the problem of increasing the capacity of single-track lines with safety.

Highway Crossing Accidents

THE railways have thus far this year further reduced accidents occurring at all places on their lines, excepting highway grade crossings, after having in 1927 made the best safety record in their history. Statistics of the Interstate Commerce Commission show that in the first one-third of the year, excluding accidents at highway crossings, the number of passengers and employees killed was reduced from 488 to 432, and the number of trespassers from 771 to 591. On the other hand, the number of persons killed at highway grade crossings increased from 669 to 697, in spite of the fact that the railways have carried on the most vigorous campaign in history to educate motorists and other persons to be careful in crossing railway tracks. There is no reason for doubting the same general tendencies will be shown by statistics for the entire first one-half of the year when they become available.

All grade crossings could not be eliminated without prohibitive cost to the railways, or the public, or both of them. The number of such crossings could, however, be greatly reduced at a comparatively small cost by the adoption of a method which has been suggested by J. M. Davis, president of the Delaware, Lackawanna & Western. This would be by restricting the opening of new crossings, closing many now in existence, and building highways parallel with the railways for short distances to concentrate highway traffic upon the remaining crossings. As Mr. Davis has pointed out, in the days of the horse and buggy numerous crossings saved considerable time, but in the days of fast moving motor vehicles the time element has become of almost no importance, and "the way has been opened for the construction of marginal or parallel highways and for doing away with countless unnecessary and expensive crossings". There are about 235 000 highway grade crossings in the entire country. Undoubtedly a large reduction in injuries and fatalities could be accomplished at small cost and with very little inconvenience to the public by the adoption of the method suggested by Mr. Davis.

It would be necessary for local authorities and railways to co-operate in reducing the number of crossings in this way and protecting those that would remain. The Supreme Court of the United States has held that the presumption is that the motorist and not the railway, is responsible for an accident at a highway crossing. It seems quite probable that this decision reduces the power of local authorities to require the elimination of grade crossings at railroad expense.

The problem of reducing grade crossing accidents has become primarily that of motorists, public authorities and the public, and the suggestion made by Mr. Davis is worthy of serious consideration by them throughout the country.

The Use of Business Cars

COMMISSIONER McManamy has proposed a report by the Interstate Commerce Commission holding unlawful certain uses that have been made of railway "private" cars, which have come to be more generally known as "office" or "business" cars. He believes it is illegal for one railway to handle such a car for another railway without charge, or to carry passengers holding tickets in such cars without charging them for berths and meals.

The practices condemned by him always have been generally assumed to be legal, and, as his proposed report shows, have prevailed generally. As a practical matter, however, the important question is not as to whether they are legal, but as to whether they are fair and desirable.

Mr. McManamy frankly concedes the advantages to the railways of the use of private cars for certain purposes. "Private cars of railroad officials", he says, "are intended to be offices on wheels for those whose duties require considerable travel over the line, and when used for that purpose are an important facility for carrying on the business of the road". If there were complete reciprocity between the railways in the handling of cars for each other there could, perhaps be no reasonable objection to handling them free. But the information furnished by the railways to the commission, and made public by Mr. McManamy, shows that such complete reciprocity is lacking. He cites numerous illustrations of the fact that cars owned by small railways are moved many more miles on large railways than the cars of these large railways are moved on the lines of the small railways. In not a few cases the small railway which is thus favored is owned by a large concern that is a big shipper. If an officer of one railroad needs to travel on business for his company in an office car over another railroad there can be no good reason why his railroad should not pay the other railroad for handling the car. If he is not traveling on business for his railroad there seems to be no really good reason why either his own or the other railroad should bear the expense of handling it.

As to passengers riding with railway officers on private cars, the contention that they should be required to pay for their berths and meals, as well as for their transportation, seems unanswerable. Whether they have business to transact with the railway officers on the car or not, there really is no good reason why they should not be required to pay as much for travel in a railway business car as in a sleeping or parlor car.

Mr. McManamy plainly shows by what he says that he does not believe there has been any intention of the railways or their officers to use business cars illegally. Furthermore, he is guarded in his condemnation of the practices which he describes. It would, however, be worse than useless for the railways to attempt to convince the commission or the public that some of the practices described are not of such a nature and have not grown so extensive that they amount to abuses. It might be well for the railways to confer with the commission, reach an agreement with it as to the rulings it should make regarding the use of business cars, and then voluntarily make their practice conform to its

rulings. Closely related to the question as to the way in which business cars should be used is the question as to the extent to which free transportation should be issued to and used by individuals. It seems probable that there are larger and more important abuses at the present time in the issuance and use of free transportation than in the use of business cars. Why, for example, should a large shipper who happens to be an officer of a small railroad be given by large railways almost unlimited amounts of free transportation for himself and his family when it would be a violation of law to give free transportation to any shipper, however large, who does not happen to be an officer of some railroad, however small?

The railway situation presents questions far more important than any that may be raised regarding the use of private cars and free passes. It might be suggested that while the commission is considering whether the practices in the use of private cars condemned by Mr. McManamy are legal, it might also be considering whether the members of the commission, in disregarding the rate-making provisions of the Transportation act, are acting in strict accordance with the laws that they are charged with administering. But abuses such as those prevailing in the use of private cars and free passes are adapted to doing the railways much harm if given publicity, and consequently should be eliminated.

The Reduction in Work Train Mileage

IN the seven years from 1911 to 1917, inclusive, the mileage operated by trains in work service averaged 45,966,987. Ten years later, in the years 1921 to 1927 inclusive, this mileage averaged 32,828,088. In this period, therefore, a reduction of more than 13 million train miles, or 28 per cent, was effected in a branch of operation that produced no revenue, but was entirely an out-of-pocket expense.

The engineering and maintenance of way department is the largest user of work trains by reason of the nature of its work, and it is in this service that the reduction has been effected in the largest part. In the past it was not infrequent practice for a work train to be assigned to a supervisor or roadmaster as a part of his regular force during the summer, if not throughout the year, while on other roads or divisions work trains were ordered freely with little thought of the cost. Of late years such practices have become less common as the expense has been more generally realized. This reduction in work train service has been made possible in some degree by the more efficient use of the trains actually employed. It is due most largely, however, to their replacement with other forms of equipment. The development of the self-propelled pile driver, ditcher and locomotive crane has made it possible for these units of equipment to run to adjacent sidings under their own power to clear trains, whereas it was formerly necessary to assign a locomotive to each such unit for this purpose. The use of similar self-propelled equipment to load ballast and other materials has done away with the necessity of spotting engines in such work. The largest reduction in the use of work trains, however, has resulted from the development of larger track motorcars and their more general use for the transportation and distribution of ties and other materials and for the hauling of gangs of men to work, even over comparatively long distances. The utilization of motor cars for such work has been developed to such an extent that not infrequently roadmasters are able to dispense with work trains entirely.

Traffic and Purchases

THE use of railway purchases to get traffic, and of traffic to influence railway purchases, apparently is steadily becoming more prevalent. At least, this is the consensus of opinion of numerous well-informed persons. If the practices involved are legally and economically sound no harm can be done now or in future by calling attention to and describing them. If they are not legally and economically sound it is better that their character and tendency should be emphasized now than later.

There is a certain device used on railway equipment, which was not able, on the basis of quality and price, to compete successfully with other devices of the same kind for the favor of railway technical and purchasing officers. There is a big manufacturing company which give a large amount of traffic to the railways, but which never has been engaged, directly or indirectly, in the manufacture or sale of railway equipment and supplies. Some men connected with this company became financially interested in increasing the sales of the device heretofore mentioned. To this end they emphasized that they controlled the large traffic of the manufacturing concern mentioned. This argument recently in certain cases has been highly effective. Some railroads that formerly would not buy this device have placed large orders for it.

A large railway supply concern recently found that one of its small competitors had got a substantial order for a certain kind of a device from a railroad to which the large supply concern long had been furnishing the same kind of a device under a contract. Upon inquiring as to the reason, it learned that its small competitor had furnished to the railroad several hundred car loads of traffic, although it had no such amount of traffic of its own to furnish. What had happened was that the small competitor had got control of the routing of the traffic of a large company not engaged in the railway equipment and supply business, and had used this to get business from the railroad.

How does one company get control of the routing of the freight of an entirely separate company? It is said that in this instance it was done by paying for it. Furthermore, it is said that this is a practice that is growing not uncommon. What are some of the effects of it? One is that the shipper who sells for, let us say, $5 a car, control of the routing of his traffic in effect gets his freight transported for that much less per car than the published tariff rate, and also for that much less than the rate paid by any of his competitors that does not sell control of the routing of his traffic. As to the concern that buys control of the routing, it increases its expenses by the amount it pays for it. Does it add this to the prices it charges the railroads for what it sells to them? If so, indirectly the railways pay in enhanced operating expenses what is received by the shipper who sells control of the routing of his traffic. Is this indirect rebating—or is it not?

There are certain very large manufacturing companies of which it is being said that they are constantly using their traffic effectively as an argument not only

to help sell their own products, but also things made by concerns not directly connected with them. Suppose that as a result of the railways yielding to this argument concerns that heretofore have been able to do business with them on the basis of the quality and price of their materials are actually driven out of the field. And suppose that, in consequence, the railways, soon afterward, are confronted with the necessity of paying substantially higher prices for materials. What, then, will be the effect upon railway net earnings of yielding to the traffic argument? In asking these questions we are not merely theorizing. Unless some apparently very well-founded reports are incorrect, this has actually occurred.

There are certain facts regarding the successful use of the traffic argument to influence railway purchases that are incontrovertible. One of these is that the diversion of traffic from one road to another does not increase the total traffic and earnings of the railroad industry. It merely increases the traffic of one road and reduces that of others, and the change is likely to be but temporary for traffic that is given to one road today to influence its purchases may be diverted to a competing road tomorrow for the same purpose. If, then, the use of railway purchases to get traffic, and the use of traffic to control purchases, has any effects upon the prosperity of the railroad industry they must be sought for in capital expenditures and operating expenses. Nobody will say they tend to reduce the amount of capital expenditures it is necessary to make or of operating expenses it is necessary to incur. Do they have a tendency to increase railway expenses? Who can doubt it? Why does any concern throw the traffic argument into the scale for any reason excepting because it doubts whether it can get business from a railroad on the basis of quality and price alone?

It is obviously desirable that the efficiency and economy of operation of the railroad industry should be steadily increased. It is obviously desirable that, as one means to this end, the equipment, materials and supplies required by the railways shall be constantly made better in proportion to the prices that have to be paid for them. It is obvious that the most direct and effective way in which the railways can stimulate the improvement of equipment, materials and supplies is by buying them on the basis of quality and price. It must follow that whenever the influence of traffic causes a railroad to buy something it would not otherwise buy, from a concern from which it would not otherwise buy it, progress in increasing the efficiency and economy of railway operation is hindered, operating expenses are made unnecessarily high and the net operating income of the industry is made less than it otherwise would be.

The individual road that gets the traffic may benefit today; but it probably will be injured by the diversion of traffic from it tomorrow owing to the same influence; and in the long run the more traffic considerations are allowed to influence purchases the worse it will be for the railroad industry as a whole and for every part of it.

It seems plain that the trading of traffic for purchases and of purchases for traffic could be carried so far that none of those responsible for it would wish to have the facts made public. Publicity regarding it might do industrial companies no harm, but it might do the railways great harm. Unless we are very badly informed—and we do not think we are—there are already things being done in this connection which those responsible for them would be very unwilling to have spread broadcast through the press. They seem to be disregarding the fact that certain branches of the government recently have shown a very strong penchant for investigating business practices.

Such practices as have been indicated are an outgrowth of the increasing competition between the railroads for traffic. Sometimes the railways have taken the initiative in using their purchasing power to get traffic; sometimes other concerns have taken the initiative in using their power to control traffic for the purpose of increasing their sales to the railways. It is not unnatural that each side should talk to the other of "reciprocity." There is, however, reciprocity between a railroad and shipper when the railroad gives the shipper good transportation service at reasonable rates; and true reciprocity between them is destroyed when the shipper uses promises or threats regarding the routing of traffic to influence the railroad to buy things it would not otherwise buy or to pay prices it would not otherwise pay.

The time seems to be about here when the railroad industry will either have to present a united front against the increasing use of traffic to influence purchases or risk the disclosure of practices which the public, whether rightly or not, would regard as hardly more defensible than the old practice of rebating.

Real or Fancied Savings

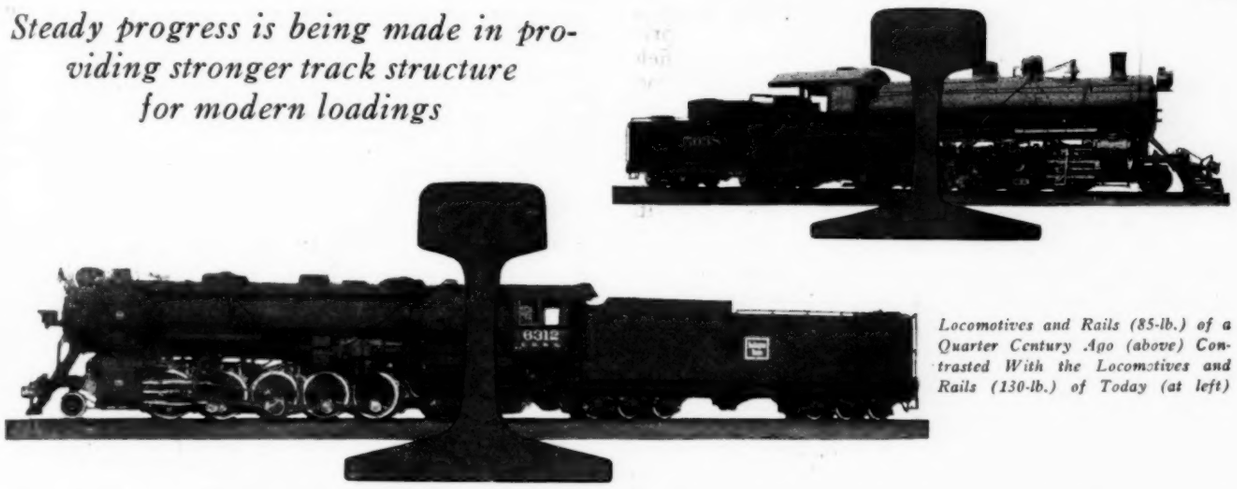
IN former years it was a common practice to lay off track forces for the closing days of a month in order to bring the expenditures for the period within certain limits. This practice has gone quite generally into the discard in recent years as its demoralizing effects have become more generally appreciated. This year, however, it is again being resorted to with sufficient frequency to warrant attention.

The immediate effect of such a step is, of course, to make a saving to the extent of the reductions effected in the payroll. The ultimate effect, however, is to reduce these immediate savings greatly, if not to eliminate them entirely. Such a measure disorganizes forces, creates dissatisfaction and destroys morale. It also increases the turnover by causing the more intelligent men to seek employment elsewhere. It is true that one cannot put his finger directly on losses resulting from disorganization of forces, but if there is any advantage in the development of morale among employees, for which the roads are spending appreciable sums today, this investment is largely destroyed by the laying off of the men for short periods. Furthermore, these layoffs are occurring during the best part of the working season when weather conditions are favorable for maximum output. With the active programs of track betterment work in which the roads are engaged this year, it should be recognized that the time now being lost by these enforced vacations cannot be recovered.

Such measures are in general an indication of inefficiency somewhere, either in authorizing certain rates of progress which must be reconsidered later in the month or in exceeding the allowances authorized. Occasionally, of course, sudden fluctuations in traffic or increases in expenses such as are occasioned by floods, etc., call for heroic retrenchment, but such conditions arise only at rare intervals. The retrenchments that are being made this year are not of this character. Rather, the fact that they are occurring from month to month indicates that they are being made with little thought or appreciation of the consequences.

Heavier Rails for Heavy Traffic

Steady progress is being made in providing stronger track structure for modern loadings



Locomotives and Rails (85-lb.) of a Quarter Century Ago (above) Contrasted With the Locomotives and Rails (130-lb.) of Today (at left)

THE outstanding trend in maintenance of way practices today is that toward the use of heavier rails. This is strikingly illustrated by the statistics of rail production in this country, compiled by the American Iron and Steel Institute. These figures show that, whereas the tonnage of rails weighing 100 lb. or more per yard constituted only 26 per cent of the total output in 1917, and 42 per cent in 1922, this ratio had risen to 68.8 per cent of the total output in 1927, and further, that of this classification, approximately 32 per cent, or almost one-fourth of the total output in 1927, was in sections weighing 120 lb. or more per yard.

The steadily increasing weight of motive power, together with the speeding up of freight as well as passenger service, have exerted a marked influence on the character of track required to carry this traffic. While, in general, the weight of rail has not increased in proportion to the traffic loads, the roadway as a whole has been markedly strengthened during the last decade, and considerable progress has been made in providing heavier and better rail.

The adoption of heavier rails has been due to a better understanding of the respective needs of the transportation, motive power and maintenance of way departments, and to the co-ordination of efforts to adjust these needs. In the improvements which have been made in the design and qualities of rail, the intensive studies of the Rail committee of the American Railway Engineering Association must be accorded full recognition. Also, the work accomplished by the Special Committee on Stresses in Railroad Track has brought to light much information of value alike to the designers of locomotives and of track, and there is reason to believe that these studies will result not only in lessening the destructive forces of the locomotive, but also in further improvement in the rails and fastenings to withstand these forces.

Locomotive Design to Ease Stresses in Rails

In this connection, it is noteworthy that the Atchison, Topeka & Santa Fe, which for several years has carried on studies with special reference to the stresses imposed on the track, has recently placed in service a passenger engine of the 4-8-4 type, with a total weight on drivers of 269,400 lb. and with a load of 70,600 lb. on the axle of the main drivers. Tests conducted under service have demonstrated that this locomotive, traveling at 60 miles an hour on tangent track, imposes a maximum equivalent static load on the rails 3,000 lb. less than that imposed by a locomotive of older design of the 4-8-2 type, with a weight on drivers of 243,100 lb. and a maximum load of 61,350 on the driving axles. This reduction in stress, in spite of an increase of from 9 to 15 per cent in individual axle loads, is encouraging, particularly to the transportation and motive power departments, since it means that greater power will be obtained without corresponding increase in the stresses the track must meet. C. B. Bronson, assistant inspecting engineer of the New York Central Lines, reports that recent types of motive power for both freight and passenger service on that road have lower axle loadings as compared with previous types, indicating a tendency on that road to obtain greater tractive effort, while at the same time decreasing weights on the axles.

Recent Developments in Use of Heavier Rails

In order to ascertain the practice of the various roads in the United States and Canada with respect to the present weight of rails for heavy traffic lines and the probable future trend, a questionnaire was addressed to the chief engineers of these roads and replies were received from roads with a total of 215,000 miles of lines, of which approximately 178,000 miles are in the United States. In digesting the information that is presented, it must be borne in mind that it applies only to those main lines handling fast or heavy traffic or both, but it must also be recognized that the adoption of heavier rail for any given main line of any system operates to provide all the main tracks of that system with heavier rails, since the rail released on the main line is usually relaid in lines of lesser importance, where it releases lighter rail which, in turn, is laid in main tracks of still less importance, and so on down the line.

The information contained in these replies shows that roads with a mileage of 60,801, or 28.2 per cent. of the total mileage represented, now use rails ranging from 127 lb. to 136 lb. per yd., as their heaviest sections; those with a mileage of 61,853, or 28.7 per cent, use

110-lb. rails; those with a mileage of 75,498, or 35.1 per cent, use 100-lb. rails; and those with 14,318 miles. or 6.6 per cent, use 90-lb. rails, while two roads, with a mileage of only 2,797, use 85-lb. rails as their heaviest section.

Large Advance in Weight of Rails Began in 1916

A marked advance in the weight of rails was made by the Lehigh Valley and the Pennsylvania in 1916, when the former road adopted the Lehigh Valley section of 136 lb. for its heavy traffic lines in place of the 110-lb. rails which had been used prior to that time, and the latter road introduced the 130-lb. Pennsylvania section to replace the former standard of 100-lb. rails. The introduction of heavier sections on the other roads of the country has been slower, although it has moved more rapidly during the last few years.

The greatest number of roads have increased the weight of rails in the last five or six years. In 1922, the Southern adopted 130-lb. rails as standard on certain parts of its line and 100-lb. rails on certain other portions where 85-lb. rails had been used previously. In the same year the Great Northern adopted 130-lb. rails for curves sharper than 5 deg. and also for continuous installation on certain mountain divisions, while the 110-lb. section was adopted as standard for other main line locations in 1926, both of these superseding 100-lb. rails. In 1923, the Northern Pacific began laying 130-lb. rails on sharp curves and in long tunnels and will also use this weight in other locations of severe service. In the same year, it adopted 100-lb. rails for tangents and light curves on its main line. The Southern Pacific adopted 100-lb. rails for its heavy-traffic main lines in 1922, to replace the 90-lb. section, and in 1927, began the use of 130-lb. rails for curved track.

In 1923, the Atlantic Coast line, the Nashville, Chattanooga & St. Louis and the Kansas City Southern adopted 100-lb. rails as standard for their heavy-traffic lines, the first named having used 90-lb. rails previously, while the heavier section supplanted 85-lb. rails on the K. C. S. and 80-lb. on the N. C. & St. L. The Atchison, Topeka & Santa Fe began the use of 110-lb. rails to replace 90-lb. in 1924, and in the same year the Seaboard Air Line adopted 100-lb. rails to replace 85-lb.

In 1925, the New York Central System adopted the 127-lb. Dudley section to supersede the 105-lb. Dudley section which it had used theretofore, while the New York, Chicago & St. Louis began the use of 110-lb. rails instead of 100-lb. During the same year the Texas & Pacific adopted 110-lb. rails to replace the 85-lb. rails which it had used before that time, and the Illinois Central and the Wabash adopted 110-lb. rails instead of 90-lb. The Richmond, Fredericksburg & Potomac went to the use of 130-lb. rails in 1926, and in the same year, a large western road adopted 110-lb. rails in place of 100-lb. In 1927, the Chicago, Milwaukee, St. Paul & Pacific began the use of 130-lb. rails for its more important lines, taking 20 per cent of its new rail tonnage in that section and the remainder in 100-lb. rails, which had been its standard for some years prior to that time. The Chicago & North Western and the Chicago, Rock Island & Pacific adopted 110-lb. rails for their more important lines in the same year to replace the 100-lb. rails which they previously used. During the present year the St. Louis-San Francisco and the Pere Marquette began the use of 110-lb. rails, the latter road changing from 90 lb., and the former road from 100 lb. The Chesapeake & Ohio has used 130-lb. rails in the last few years to replace 100-lb. rails as rapidly as conditions would justify and is considering rail sections heavier than 130 lb. but no change to such sections will be made in the immediate future.

Few of the roads which have changed to heavier rails recently, contemplate any further changes in the immediate future, but the Kansas City Southern will install 10-mile experimental sections of 115-lb. and 127-lb. rails of the Dudley section. The Buffalo, Rochester & Pittsburgh, which has been using the 100-lb. A. S. C. E. section since 1912, is giving consideration to the 115-lb. Dudley section and the 120-lb. R. E. section, and will probably change to one or the other of these sections next year. The Delaware & Hudson, which now uses the 90-lb. A. S. C. E. section, is considering the adoption of either the 127-lb. Dudley or the 130-lb. R. E. section, according to H. S. Clarke, engineer maintenance of way.

Reasons for Heavier Rails

The reasons advanced for adopting heavier rail were varied, but come under one or all of four general headings, which include the expectation of a reduction in maintenance of way expenses, increased life of the rail, a reduction in rail failures, and an improvement in track conditions. While it is felt generally that all these desired results have been attained, in many cases the heavier rail has not been in service long enough to enable it to be compared directly with the lighter rail. This is further complicated by the fact that it is often impossible to segregate the values of improvements in the track between those due to reballasting and those due to the heavier rail.

Hunter McDonald, chief engineer of the Nashville, Chattanooga & St. Louis, who has devoted much study to the subject, emphasizes the difficulty of making specific comparisons on this account. C. A. Morse, chief engineer of the Chicago, Rock Island & Pacific, while recognizing the difficulty in allocating the benefits gained by the various improvements in the roadbed and track, contemplates securing all the foregoing advantages from heavier rail, and sees in the other improvements in the track structure an indication that the weight of rails on the western roads will increase more rapidly in the future than it has in the past.

In this connection, Mr. Morse has aptly described the situation as similar to that of a growing boy who has been furnished with larger clothes and a larger hat, with no larger shoes. "We have been backward in increasing the weight of our rail", he says, "although during the last two or three years there has been a movement to correct this failure to furnish shoes for the growing boy." To amplify this statement, Mr. Morse has sketched in a graphic manner the increase in the weight and power of the locomotives on the Rock Island from 1910 to 1926, which is, in general, typical of the other large roads in the same territory. In 1910, the Rock Island had 1,306 locomotives, with an average weight on drivers of 60.69 tons and an average tractive power of 26,690 lb. In the same year, the gross ton miles of freight traffic on that road amounted to 5,598,000,000, with a freight locomotive mileage of 17,512,000. In 1926, by coincidence, the Rock Island again had 1,306 locomotives, but the average weight on drivers had advanced to 83.85 tons, an increase of 38 per cent, and the average tractive power to 38,182 lb., an increase of 43 per cent. In the latter year, these 1,306 locomotives made a total mileage of 17,372,000, slightly less than that made by the same number of locomotives in 1910, but the gross ton miles of freight traffic mounted to 8,317,000,000, an increase of 50 per cent.

In 1910, the heaviest rails on the Rock Island weighed 85 lb. per yard. In 1911, the laying of 100-lb. rails was begun on its heaviest traffic lines, and in the following year 90-lb. rails were introduced on the lighter main lines. At the end of 1926, 1,202 miles of 100-lb. rails and 1,362 miles of 90-lb. rails had been laid, the remainder of the 8,000 miles of main tracks being laid with rails weighing 85 lb. or less per yard. The first 110-lb. rails were laid in 1927, and beginning with the 1928 program, all new rails on the Rock Island are to be of the 110-lb. R. E. section.

Specific Benefits Cited

Other roads have more specific data to offer on the advantages obtained by the heavier rails. The Canadian National began replacing its 85-lb. rails with 100-lb. rails some years ago, and M. S. Blaiklock, assistant chief engineer, states that under the same conditions the heavier rail shows a saving of about $100 per mile per year in maintenance costs; that the life of the rail is increased about 30 per cent; that rail failures are only about half the number that occurred in the lighter sections, and that line and surface are easier to maintain, while there is less damage to the ties. J. M. R. Fairbairn, chief engineer of the Canadian Pacific, which road adopted the 100-lb. section in place of 85-lb. rails in 1921, says that the reduction in rail failures in the heavy rail has been "very substantial," and that the riding qualities of the track have been improved, while its safety has been increased, due to the reduction of rail failures.

According to C. J. Geyer, engineer maintenance of way of the Chesapeake & Ohio, experience on that road indicates that the life of the 130-lb. rails will be about double that of the 100-lb rails under the same traffic. He further says that the failures in the 130-lb. rails are 22.4 per cent under those in the 100-lb. section, and that the use of 130-lb. rails in place of 100-lb. rails permits track conditions to be improved with the same labor allowance, or held at their former condition with a reduction in labor expense.

J. R. W. Davis, chief engineer of the Great Northern, states that the cost of track maintenance is reduced, owing to the better joints, a better distribution of the rolling load and a reduction in the wave movement of the rail. He also says that the life of the rail is increased on account of the higher carbon content of the larger sections and that there has been a reduction in rail failures, largely in proportion to the decrease in the unit stresses in the large sections. The 130-lb. P. S. section was chosen on account of its large head, which provides a greater wearing area.

W. H. Penfield, engineer maintenance of way of the Chicago, Milwaukee, St. Paul & Pacific, advises that the reasons for adopting the heavier sections on that road were to reduce maintenance expenses, not so much in the actual cost of rail replacement, as in the labor to maintain the track in line and surface; reduce tie renewals, and secure a better track. The selection of the 130-lb. rail to replace 100-lb. rail on the principal main line divisions was made to provide properly for the present traffic as well as for a period of from 15 to 20 years in the future, and the same considerations led to the adoption of 100-lb. rails on lines where 90 lb. was formerly used.

A. F. Blaess, chief engineer of the Illinois Central, reports that it is not necessary to expend as much labor in keeping up the track with 110-lb. rails as was necessary with 90-lb. rails, and that there has been a considerable reduction in failures in the 110-lb. rails as compared with those of 90 lb., as is shown in the subjoined statement.

Year Rolled	Year Ending	Weight of Rails	Failures per 100 Mile Years
1925	October 31, 1926	90-lb.	18.07
1925	October 31, 1926	110-lb.	4.00
1925	October 31, 1927	90-lb.	20.22
1925	October 31, 1927	110-lb.	4.95
1926	October 31, 1927	90-lb.	24.51
1926	October 31, 1927	110-lb.	4.90

On the New York Central, Mr. Bronson says that the necessary data have not yet been secured as to the effect of heavier rail on the cost of track maintenance, although an increase of several years in the life of the heavy rail is anticipated. He further says that, with the exception of an occasional crushed head in the rails rolled by one mill, there have been practically no failures in the 127-lb. rails. E. M. Hastings, chief engineer of the Richmond, Fredericksburg & Potomac, reports that the cost of track maintenance has been reduced, that the life of the 130-lb. rails is expected to be 75 per cent greater than of the 100-lb rails which they replaced, and that there have been no failures in the 130-lb. rails since they were installed in 1926. Both Mr. Bronson and Mr. Hastings say that there have been noticeable improvements in track conditions due to the use of the heavier rails.

Louis Yager, assistant chief engineer of the Northern Pacific, reports that the condition of 130-lb. rails which had carried traffic for three years on sharp curves indicated that they would be in place another three years before it would be necessary to replace them, while 90-lb. rails on the same curves usually lasted only 18 months, and adds: "Our experience thus far clearly demonstrates that the increased investment in the 130-lb. rails for curves and other places of severe wear is paying us greater returns in maintenance economy than any other improvement in our track standards in recent years. The stiffer section also gives us greater assurance from the standpoint of safety."

While the general view is that the quality of steel has been improved, and that the use of heavier rails has been of marked benefit, the observations of many of those furnishing data show that still further improvements are desirable. The principal deficiencies cited in present day rails include transverse fissures and other internal defects; softness of the metal, resulting in excessive wear on curves, as well as battering and chipping, and lack of uniformity in the quality of the steel, although Colonel F. G. Jonah, chief engineer of the St. Louis-San Francisco, notes an improvement in this latter respect in the rails rolled in 1926 and 1927. Mr. Morse, of the Rock Island, feels that the greatest deficiency in rails today is the lack of heavy rails. He also cites transverse fissures and the rapid wear of rails on curves, but hopes that the new transverse fissure detector car, which is being developed by the A. R. A., will be successful, and thus render unnecessary the practice of changing out all the rails from any heat as soon as that heat has developed three transverse fissures. He feels that curve wear will be minimized by the use of flange oilers, either on the locomotive or affixed to the rails.

The chief engineer of a large western road says that the greatest need is stronger joints, in which view he is supported by W. S. Hanley, chief engineer of the Cotton Belt, who believes that improved joints would do much to eliminate the battering of rails. Louis Yager, assistant chief engineer of the Northern Pacific also feels that there should be an improvement in joints which will permit ready adjustment due to temperature changes in order to maintain more uniform expansion gaps, and thus minimize the tendency to battered joints,

which is accelerated by the softness of the rails, and which would affect their service life seriously if it were not for recent developments in building up battered rail ends by welding. In this connection he refers to the interesting experimental work along these lines, which has been carried on by Hunter McDonald of the Nashville, Chattanooga & St. Louis. A. N. Reece, chief engineer of the Kansas City Southern, advises that his road is experimenting with longer joint bars to reduce the battering of rails.

With respect to specifications, it is found that most of the larger roads are using those adopted by the A. R. E. A. in 1925, and feel that they have resulted in an improved quality of rail. The provision that all three test pieces must withstand the drop test, and the segregation and marking for identification of the A rails and those with high and low carbon content are especially commended as contributing to safety and to greater service life. As a means of eliminating the disproportionately large number of rail failures from A rails, the Santa Fe, the Canadian National and the Great Northern have modified these specifications by the elimination of A rails entirely, taking in their stead an equivalent tonnage of tie plates rolled from that portion of the ingot from which the A rails would be obtained, while other roads contemplate adopting the same practice. It is the custom of numerous other roads to confine the use of A rails to lines of slow or light traffic, although some of the roads are experiencing difficulty in finding sufficient places of this character to provide for the tonnage of these rails which they receive.

The classifying of the rails as to carbon content permits the selection of high carbon rails for use on curves, although some roads report difficulty in obtaining sufficient rails of this kind for their needs. On the other hand, L. C. Hartley, chief engineer of the Chicago & Eastern Illinois, advises that since that road has few curves, it is possible to provide high carbon rails for practically all of them.

In 1927, the Canadian Pacific adopted its own specifications, which were prepared in close co-operation with the Canadian rail manufacturers. These embody the nick and break test and this, together with the drop test provision, which is similar to that of the A. R. E. A., are said by Mr. Fairburn to "result in the acceptance of a maximum amount of sound steel and a maximum rejection of unsound metal."

The New York Central Lines use the Dudley specifications, which were prepared by the late Dr. P. H. Dudley in 1909, but which have been revised to provide for the separation and marking of A rails, and rails of high and low carbon content. A slight modification was made in the range of silicon, changing from the former limits of 0.10 to 0.20 to limits of 0 10 to 0.25. This road also had made greater use of medium or intermediate manganese rails which give indications of being superior to standard open hearth rails on account of their greater toughness, finer grain structure and greater freedom from rolling mill defects, resulting in greater resistance to wear and fewer rail failures. The chief engineer of an important western road reports that a large tonnage of intermediate manganese rails has been purchased by his road during the last two years, and that the tests made at the time of rolling, as well as the results obtained in service, appear very promising. Mr. Reece, of the K.C.S., advises that intermediate manganese rails, on curves of 3 deg. and over, have shown a longer life than open hearth rails laid in the same locations.

The Northern Pacific installed some Sandberg Sorbitic rails on sharp curves in its mountain territory in 1924, and an inspection made three years later showed that the loss of metal by abrasion, as well as the flow of metal on the low side, to have been considerably less than in the case of open hearth rails on similar curves carrying the same tonnage. The Kansas City Southern also reports similar results with the use of Sandberg Sorbitic rails on curves of 5 deg. and over.

From the foregoing, it is plain that both the weight and quality of rails are receiving their due share of attention, and that there has been acceleration of interest in this respect in recent years. An encouraging feature is the study which is being devoted to the design of modern power, whereby heavier axle loadings, with consequent greater tractive force, are being secured with less punishment to the track than was inflicted by locomotives of the older designs.

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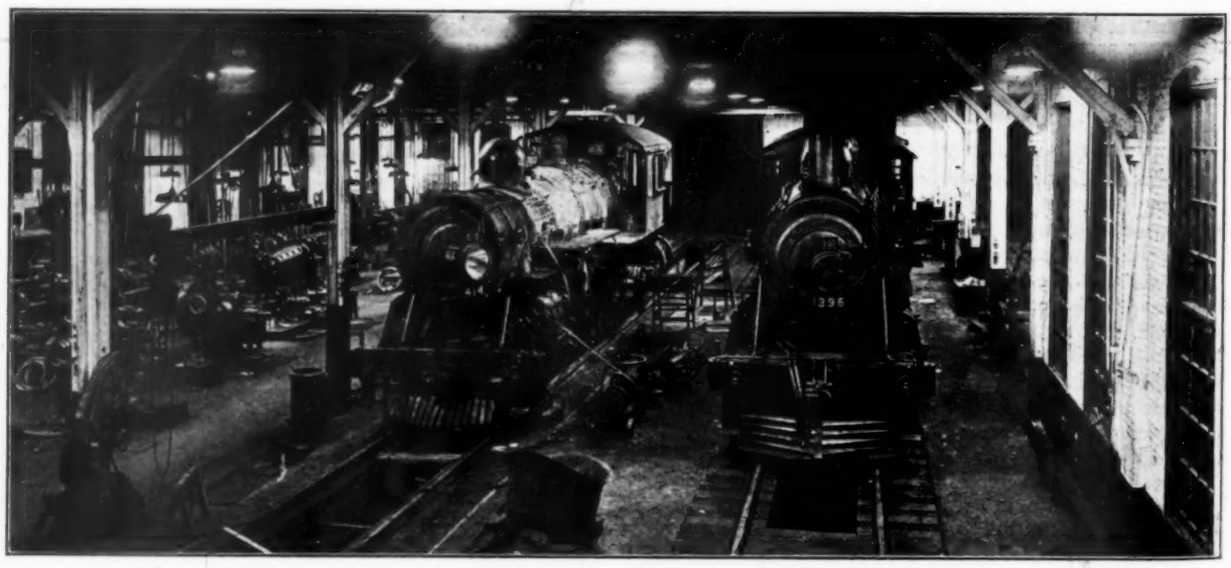


A Small Locomotive Erecting Shop with Machine Bay, Left

Running Time Reduced 1 Hour 44 Minutes on Single-Track Division

Norfolk & Western installed automatic signals and changed from Form 31 to Form 19 orders, which shortened station delays decidedly on 100 miles of line

View From Rear of Eastbound Passenger Train Showing Freight on Siding Ready to Follow

FOLLOWING the completion of extensive improvements, including the renewal of rail, reballasting, and the installation of automatic block signals on the 100-mile single-track division of the Norfolk & Western from Portsmouth, Ohio, to Cincinnati, the average running time of through freight trains between terminals has been reduced 1 hr. 44 min. Most of this saving is in overtime and results in a reduction in wages of engine and train crews of more than $2,000 a month. Six operators at intermediate stations have also been relieved, which further increases the savings by about $900 per month.

This line, formerly known as the Cincinnati, Portsmouth & Virginia, was built through rolling hilly country, 10 to 15 miles north of the Ohio river. In addition to numerous short grades, there are several long grades with a large number of short curves. The ruling grade for eastbound trains is 1.394 per cent for 2.5 miles from Lawshe to Peebles, while the maximum grade westbound is 1.4 per cent for 4 miles from Lawshe to Seaman. Another heavy grade westbound of 1.111 per cent extends for 1.5 miles from Mineral Springs to Beaver Pond. In 2 miles of the hill from Lawshe to Seaman, the total curvature is 237 deg.

The Norfolk & Western acquired this line in 1901, to extend its through route from the eastern seaboard into Cincinnati. An improvement program undertaken in 1923 and continued through 1925, included the strengthening and rebuilding of bridges to carry heavier locomotives, and the progressive replacement of light rails with rails of 100-lb. section. A considerable proportion of the line was also reballasted with crushed rock or slag, and a heavy renewal of ties was made. The passing tracks were lengthened to hold 65 cars. During the summer of 1926, automatic signals were installed, the last section being placed in service on September 20 of that year. These signals are the Union Switch & Signal Company's position-light type, operating on alternating current with regular absolute permissive block control circuits.

The westbound traffic on this division averages about 270 cars per day, of which 53 per cent is coal, 34.7 per cent merchandise and manufactured products, 2.6 per cent lumber and 9.7 per cent miscellaneous. Coal from the West Virginia fields moves from Portsmouth to Cincinnati to the extent of about 200 cars a day in heavy seasons. The N. &. W. also handles as high as 75 to 100 cars of perishable and high-class merchandise freight from the eastern seaboard to Cincinnati for western connections daily in certain seasons, in addition to lumber and other manufactured products from the Southeast.

The eastbound traffic consists of manufactured goods, agricultural products, food stuffs and miscellaneous. From 25 to 35 cars of automobiles are handled daily out of Cincinnati for the Southeast.

Train Loading for Grades

The principal type of loocmotive assigned for through freight service was a 2-6-6-2 type, known as Class Z-la, with 80,859 lb. tractive power. In March, 1926, a few 4-8-0 type locomotives, known as Class M-1, with 40,-163 lb. tractive power were used as doubleheaders, while in March, 1927, none of the Class M-1 locomotives were used but several 4-8-0 type locomotives, known as Class M-2, with 52,457 lb. tractive power were used on time freights.

Two tables of tonnage ratings are used for the westbound trains. Table I gives the ratings for trains that can be handled over the ruling grade from Lawshe to Winchester, while Table II gives the ratings for slow freight trains that can be handled over the hill from Mineral Springs to Peebles, but which have to double over the heavier grade from Lawshe to Winchester. Time freights are given tonnage such that they need not double over the hill. Ordinarily, only one or two trains of dead freight, principally coal, double over this hill per day. Whenever the tonnage is available all trains are handled with engines double heading, which practically doubles the tonnage ratings.

Table III shows the tonnage ratings that can be handled eastbound over the ruling grade from Lawshe to Peebles. On account of the heavy movement of empty coal cars the tonnage rating cannot be filled out for all eastbound trains.

When making a study of the benefits to train operation, of the new facilities such as the signaling, it is necessary to select periods in which there have been no important changes in the physical characteristics such as grades, or in the class of the locomotives used. For this reason, the operating statistics for March, 1926, prior to the time the signals were placed in service, were compared with those for March, 1927. In

the interval between these two periods no changes were made in the grades and only a slight change in the classes of locomotives assigned to this division, although about thirty-three miles of new rail were laid on this division, and about thirty-two miles were re-

Tables I and II—Tonnage Ratings

EAST PORTSMOUTH TO CLARE
Without Doublind Hill

Class of Engines	Class of Service	Rating A Normal
Z1a	Slow	1675
	Time	1600
Two Z1a	Slow	3300
	Time	3200
One M or W	Slow	875
	Time	750
Z1a and M	Slow	2550
	Time	2450
Two M-2	Slow	2000
	Time	2000
Two M or W	Slow	1750
	Time	1500
To Double Hill		
Z1a	Slow	2450
Two Z1a	Slow	4800
One M or W	Slow	1200
Z1a and M	Slow	3550
Two M or W	Slow	2350
Two M 2	Slow	2900

TRAIN LIMIT—Slow and time freights, 75 cars.

ballasted. Therefore, with the physical characteristics of the line and the locomotives practically the same, any improvement in train operation can, in large part, be attributed fairly to the benefits of the automatic signals as compared with manual block.

Briefly the average road time of westbound through freight trains was reduced 1 hr. 51 min, and of eastbound freight trains 1 hr. 37 min. These calculations are based on 294 through freight trains in March, 1926, and 307 in March, 1927.

In order to show where the delays were eliminated the dispatcher picked out the train sheet for March 23, 1926, before the signals were installed, and compared it with that for March 30, 1927. On these two days the same number of trains was operated, and the number of locomotives used was approximately the same.

Table III

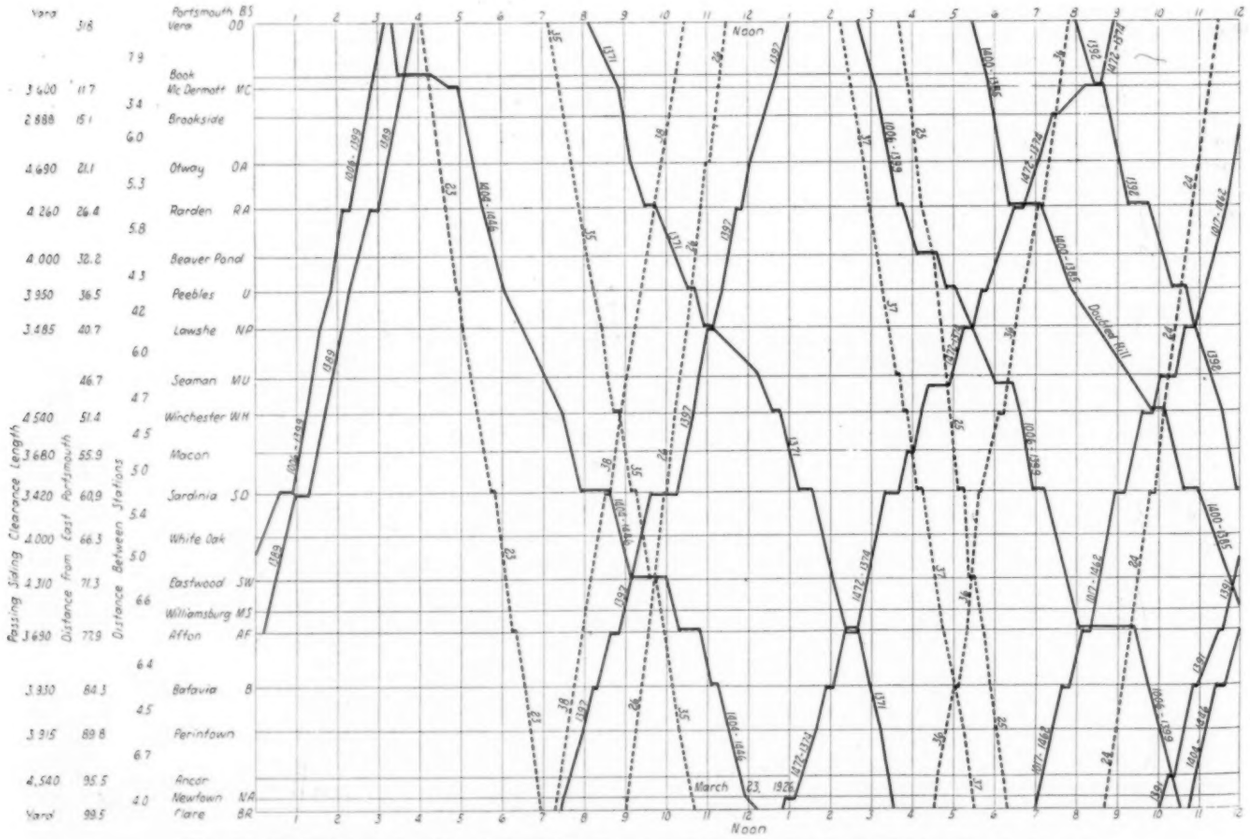
CLARE TO EAST PORTSMOUTH

Class of Engines	Class of Service	Rating A Normal
One M or W	Slow and Time	850
Z1a	Slow and Time	1675
Two Z1a	Slow and Time	3350
Z1a and M	Slow and Time	2525
Two M or W	Slow and Time	1700
Two M 2	Slow and Time	2000

TRAIN LIMIT—75 cars.

Only one train doubled the hill on each of the two days. The train miles were, of course, the same. The through tonnage amounted to approximately 22,000 gross tons on March 23, 1926, and 21,000 gross tons on March 30, 1927, the gross ton miles for through freights being 2,293,493 on March 23, 1926, as compared with 2,150,904 on March 30, 1927. It may, therefore, be seen that these two days are fairly comparable, so far as traffic is concerned.

According to the chief train dispatcher, who has been in charge of the direction of trains on this district for many years, the benefits of the automatic signals may be summarized somewhat as follows:



Graphic Train Chart for March 23, 1926, Showing Delays at Stations Waiting for Orders Prior to the Installation of Signal

With the manual block, the Form 31 order was used for all movements involving the protection of passenger trains. Form 31 orders were also used to restrict the movements of all trains, while Form 19 orders were used for advancing them. With the automatic signal protection, the Form 19 is used for all train orders, which saves an average of 20 min. for each stop previously made for the delivery of a Form 31 order to a heavy train, such as a coal train.

Table IV—Showing Separation of Time Between Terminals

March 23, 1926

Eastbound					Westbound				
Eng. Class	Engine Number	Road Time	Running Time	Waiting Time	Eng. Class	Engine Number	Road Time	Running Time	Waiting Time
M-1	1006				Z-1a	1404			
Z-1a	1399	5:00	4:12	:44	Z-1a	1446	8:55	5:42	3:13
Z-1a	1389	5:29	4:21	1:08	Z-1a	1371	7:15	6:00	1:15
Z-1a	1397	5:35	4:32	1:03	M-1	1006			
					Z-1a	1339	7:53	5:05	2:48
Z-1a	1472				Z-1a	1400			
Z-1a	1374	8:08	5:42	2:26	Z-1a	1385	8:48	6:05	2:43
M-1	1017								
Z-1a	1462	5:26	3:51	1:35	Z-1a	1392	6:37	4:36	2:01
Z-1a	1391	5:19	4:28	:51					
Z-1a	1404								
Z-1a	1446	5:50	3:30	1:20					

March 30, 1927

Eastbound					Westbound				
Z-1a	1375								
Z-1a	1389	4:25	4:05	:20	Z-1a	1391	6:00	4:59	1:01
Z-1a	1400	4:40	4:22	:18	M-2	1102			
					M-2	1104	4:35	4:09	:26
Z-1a	1333								
Z-1a	1457	6:15	5:28	:47	Z-1a	1333	5:25	4:41	:44
M-2	1150				Z-1a	1375			
M-2	1160	4:12	4:02	:10	Z-1a	1389	7:50	6:16	1:34
Z-1a	1399	5:17	4:42	:35	Z-1a	1400	5:05	4:02	1:03
Z-1a	1392								
Z-1a	1391	5:09	4:21	:48					
Z-1a	1385	5:31	4:26	1:05					

Table V—Showing Make-Up of Trains on Days Compared

March 23, 1926

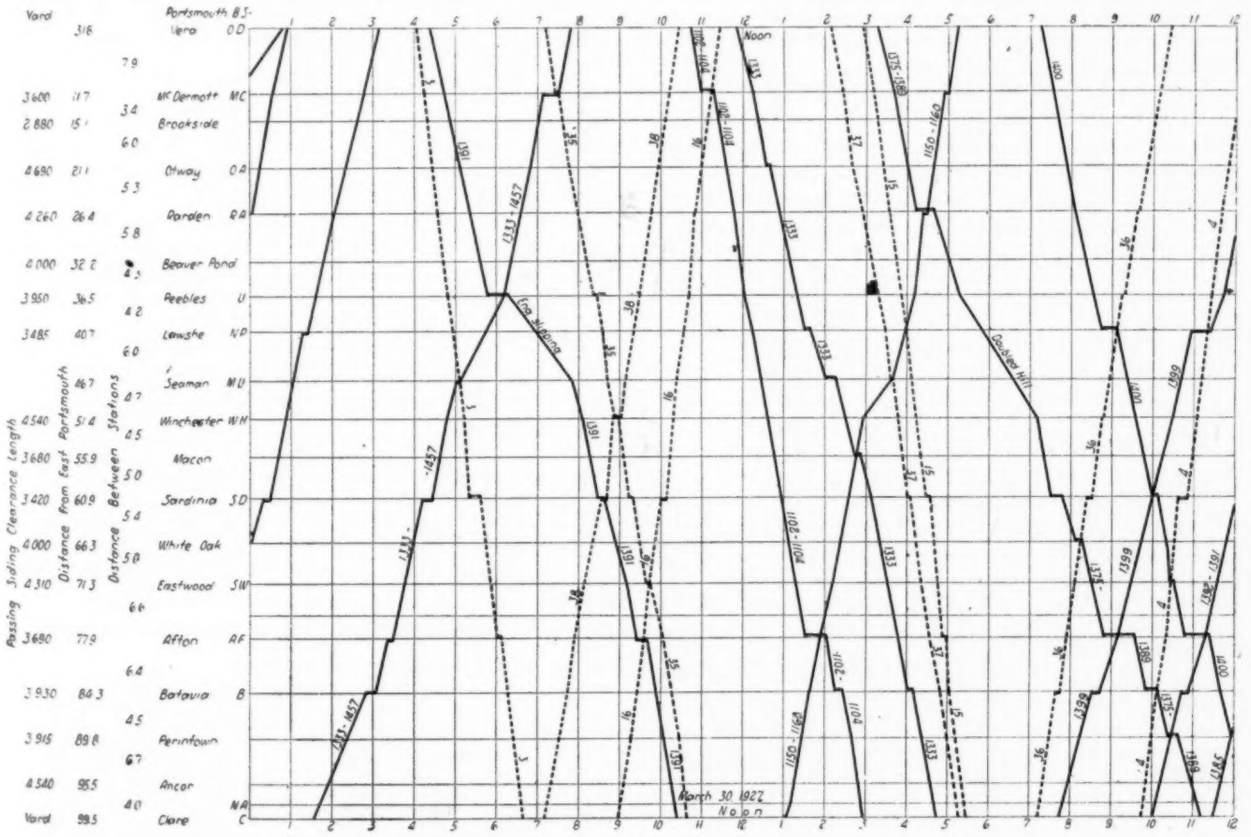
Eastbound					Westbound				
Engine	Class	Loaded	Empty	Tonnage	Class	Engine	Loaded	Empty	Tonnage
1006	M-1	45	2	1,721	Z-1a	1404	47	5	3,330
1399	Z-1a	45	2	1,721	Z-1a	1446	48	5	3,355
1389	Z-1a	41	0	1,501			28	6	2,190
		39	1	1,469	Z-1a	1371	23	5	1,839
1397	Z-1a	19	14	1,130	M-1	1006	51	19	2,236
		18	14	1,035	Z-1a	1339	51	19	2,236
1472	Z-1a	0	62	1,350	Z-1a	1400	58	0	4,489
1374	Z-1a	7	65	2,082	Z-1a	1385	55	0	4,194
1017	M-1	1	40	867			17	11	1,050
1462	Z-1a	1	24	648	Z-1a	1392	17	11	1,050
1391		36	1	1,344					
	Z-1a	37	1	1,387					
1404	Z-1a	40	1	1,648					
1446	Z-1a	33	1	1,128					

March 30, 1927

Eastbound					Westbound				
1375	Z-1a	30	8	1,319			29	3	1,680
1389	Z-1a	33	8	1,476	Z-1a	1391	23	2	1,426
1400		35	1	1,218	M-2	1102	61	0	1,983
	Z-1a	35	1	1,218	M-2	1104	61	0	1,983
1333	Z-1a	13	64	1,876			26	4	1,607
1457	Z-1a	11	65	1,826	Z-1a	1333	31	4	1,752
1150	M-2	41	0	1,584	Z-1a	1375	62	0	4,895
1160	M-2	42	0	1,619	Z-1a	1389	61	0	4,815
1399	Z-1a	13	46	1,504	Z-1a	1400	18	6	965
		13	46	1,504			18	6	965
1392	Z-1a	47	2	1,775					
1391	Z-1a	47	2	1,775					
1385	Z-1a	25	11	1,104					
		24	13	1,094					

Note:—Top figures represent cars and tonnage out of initial terminal and bottom figures represent cars and tonnage into final terminal.

The two graphic train sheets give an idea of how the delays were reduced. The through freight trains are represented by the heavier lines, and are marked by the locomotive numbers of four digits, while the passenger trains are shown as dotted lines with train numbers of one or two digits. Station delays are shown by horizontal lines. Even a casual comparison of the two diagrams shows the reduction, not only in the number, but also the duration, of the station delays. As shown in the table, the total time at stations for the



Graphic Train Chart for March 30, 1927, Showing Number and Duration of Delays at Stations After Signals Were Installed

12 through freight trains on March 23, 1926, was 21 hr. 7 min. as compared with 8 hr. 51 min. for the same number of trains on March 30, 1927. For example, an eastbound train, pulled by engine 1472-1374, left Clare at 12:48 p.m. on March 23, 1926, and as shown on the diagram, made 10 station stops, averaging 14.6 min. each. In comparison, a train, pulled by engines 1150-1160, left Clare at 1:04 p. m. on March 30, 1927, and made only two station stops, totaling 10 min. or averaging 5 min.

With the straight manual block, a train was required to clear a superior train and report to the dispatcher before the superior train was due at the next open telegraph office, while, with the automatic signals, a train is required to get in the clear only in time to prevent a delay, which is about five minutes in advance of the other train. For example, the westbound train, pulled by engines 1404-1446, which left Portsmouth at 2:40 a. m., at Vera 3:20 a. m. on March 23, 1926, waited at Sardinia from 7:56 to 8:38, a period of 42 min., for passenger train No. 38 to pass. Again, the same freight train made a good meet at Eastwood with freight train No. 1397 about 9:10 a. m., but waited there about 50 min. for two other passenger trains.

On account of the fact that freight trains were on the road between terminals 1 hr. 40 min. less time, it is natural that the operation should be less complicated. With the same number of trains operated on the two days compared, there were 30 meets on the day selected in 1926, as compared with 16 on the day in 1927. The number of times that trains were stopped for meets or orders was reduced from 70 to 36, while the average duration of each stop was reduced from 18 min. to 6.3 min. These stops include all stops for water, setting out, picking up, etc., as well as stops for orders, as there is no means of separating the two. However, the stops required for other than train orders should be approximately the same under either method of operation.

When a freight train was given a permissive order to follow another freight train into a manual block under the old system, the engineman of the second train did not know how far ahead the other train was. As a result, he had to run around each curve under control, prepared to stop. Under such circumstances, considerable time was lost and the block was occupied longer than necessary.

Table VI—Comparison of Time Required for Average Freight Train Operation in March, 1926-1927

		1926	1927	Saving in Overtime
W.B.	Out terminal	1 hr. 21 min.	1 hr. 09 min.	
	On road	9 03	7 12	1:51
	Into terminal	42	39	
	On duty	11 06	9 00	
E.B.	Out terminal	48	44	
	On road	6 59	5 22	1:37
	Into terminal	50	55	
	On duty	8 37	7 01	

Table VIII—Freight Train Operating Statistics for March, 1926-1927

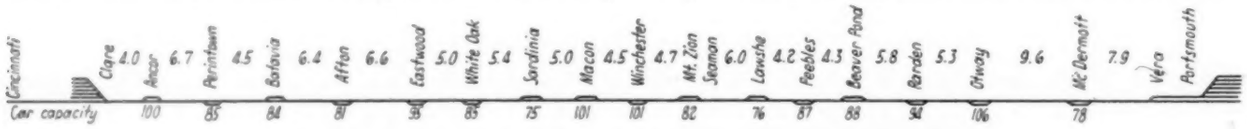
Item		1926	1927	Increase or Decrease*
Number of trains, slow freight....	E.B.	38	58	
	W.B.	67	69	
Number of trains, time freight.....	E.B.	109	95	
	W.B.	80	85	
	Total	294	307	
Average time on road.....	E.B.	6 hr. 59 min.	5 hr. 22 min.	1:37*
	W.B.	9 hr. 03 min.	7 hr. 12 min.	1:51*
Freight train miles.....	E.B.	17,446	18,090	644
	W.B.	17,824	18,544	720
	Total	35,270	36,634	1,364
Gross ton miles, freight (thousands)	E.B.	24,264	23,624	640*
	W.B.	37,344	45,023	7,679
	Total	61,608	68,647	7,039
Train hours, freight.....	E.B.	1,455	1,207	248*
	W.B.	1,802	1,488	314*
	Total	3,257	2,695	562*
Gross ton miles per train mile.....	E.B.	1,339	1,260	79*
	W.B.	2,012	2,334	322
	Total	1,679	1,804	125
Train miles per train hour.....	E.B.	12.5	15.6	3.1
	W.B.	10.3	13.0	2.7
	Total	11.3	14.2	2.9
Gross ton miles per train hour.....	E.B.	16,754	19,656	2,902
	W.B.	20,760	30,318	9,558
	Total	18,970	25,543	6,573
Pounds of coal per locomotive mile		335.9	303.2	32.7*
Pounds of coal per 1,000 gr. ton miles		287.7	256.7	31.0*

Results for Comparable Months

In order to show the results on a larger scale, the month of March, 1926, was compared with March, 1927. In the first month, there were 294 through freight trains, as compared with 307 in the latter month. The average road time, terminal to terminal, for westbound trains was 9 hr. 3 min. in March, 1926, as compared with 7 hr. 12 min. in March, 1927, a reduction of 1 hr. 51 min. For eastbound trains, the reduction was from 6 hr. 59 min. to 5 hr. 22 min. or 1 hr. 37 min. The overtime for engine and train crews in March, 1926, was $3,975.48 as compared with $1,500.68 in March, 1927, a reduction of $2,474.80.

The installation of the automatic signals also permitted the elimination of three operators at White Oak, two at Eastward and one at Lawshe. The savings of their wages amounted to about $900 per month.

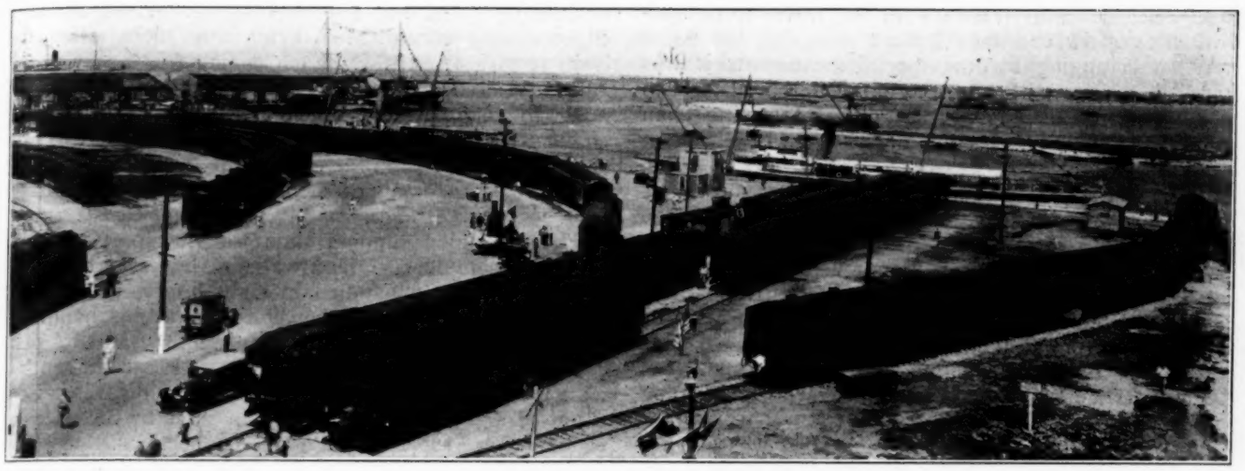
In order to get a comparison of the freight train operating statistics, the data shown in Table VIII were compiled, showing the train miles, ton miles, train hours, ton miles per train hour, etc. The saving in coal, as a result of the reduction in train stops and delays, was 31 lb. per 1,000 gross ton miles, or 1,064 tons per month.



Track Plan Showing Location and Car Capacity of Passing Sidings

Table VII—Showing Number of Trains and Percentage of Rating

		March, 1926					March, 1927				
		Trains	Tonnage Rating	Tonnage Hauled, Average Per Train	Cars	Per Cent of Rating	Trains	Tonnage Rating	Tonnage Hauled, Average Per Train	Cars	Per Cent of Rating
				1926					1927		
Slow	E.B.	38	2,546	1,211	55	47.5	58	2,591	1,242	52	47.9
	W.B.	67	3,324	3,2 9	45	98.5	69	4,462	4,415	60	98.9
Time	E.B.	109	1,948	1,425	41	73.1	95	2,373	1,585	46	66.8
	W.B.	80	2,027	1,831	50	90.3	85	1,857	1,665	44	89.7



Shriners' Specials Parked at Miami, Fla.

Handling a Large Special Passenger Movement Successfully

Florida East Coast, by careful advance preparation, made an excellent record during Shrine convention

By H. N. Rodenbaugh

Vice-President, Florida East Coast

THE 1928 meeting of the Imperial Council of the Ancient Arabic Order of the Nobles of the Mystic Shrine was held in Miami, Fla., on May 1, 2 and 3. This was the first time that the Shrine had held its convention in Florida, and it was the largest convention Miami had ever entertained. The Florida East Coast handled approximately 10,000 people into Miami for this meeting, on 39 special trains in addition to overflow sleepers on its regular trains.

The successful handling of this passenger movement without delay to the heavy northbound perishable traffic that was moving at the same time, demonstrated the adequacy of the facilities which the Florida East Coast has provided in the last three or four years in the form of heavy and fast power, double-track, rock ballast, and automatic block signals, as well as careful planning and complete co-operation between departments. In spite of the fact that the special trains were handled during the peak of the heavy perishable movement and that power was used that had recently been withdrawn from the heavy passenger tourist service, no mechanical failures were experienced, and although some of the crews had been used to only a limited extent in passenger service, there were no complaints of any kind, indicating a high standard of maintenance and personnel.

Advance Preparations Made

As soon as it was definitely decided that the convention would be held in Miami, the Florida East Coast appointed a Shrine committee, under the general chairmanship of the assistant general manager. This committee was composed of representatives of various departments, including the general superintendent of transportation, the superintendent of motive power, the assistant general passenger agent, the engineer maintenance of way, the general storekeeper, the division superintendents, and others from the operating, traffic, signal, electrical and other departments. This committee met regularly twice a month for several months prior to the convention, minutes of each meeting being taken and distributed in mimeograph form to all concerned.

The preparations made by the committee were based on an estimate of the business to be handled, supplied by the passenger traffic department. To assist the traffic representatives in securing the necessary data for the use of the committee and as an aid in the solicitation of special movements, a survey was made of the most desirable parking locations for trains at Miami, and six such locations were decided upon, with a total capacity of 1,533 cars. A folder was prepared, four in. by nine in. in size, containing a map of the Miami terminal district, drawn to a scale of 1½ in. to the mile, on which the parking locations were shown. The map indicated clearly the main thoroughfares of the city and suburban territory, as well as the beaches, hotels and other points of interest and was a decided aid in the solicitation of the business. As soon as a special movement desiring parking space was secured by the traffic department, it was given a definite location on one of the parking spaces and the committee was advised. This information was gradually assembled until a reasonably accurate estimate of the total could be made, when definite plans were adopted for taking care of the parking and dining cars, for the handling of special movements

to be released on arrival and for the travel to be handled in overflow cars on regular trains.

When arranging for the special movements it was found that many of the Shrine temples desired to have their special trains stop over for periods varying from an hour to a day at St. Augustine, Daytona Beach, West Palm Beach and other East Coast resort cities. Also, some of the special trains were handled to Key West where they were held while the Shriners took advantage of the facilities for a trip to Havana, Cuba.

The perfect handling of the movement was made possible by having the essential information concerning scheduled running time, stop-overs, parking location or destination terminal handling in the hands of everyone interested. This was accomplished by issuing between 400 and 500 copies of a book of itineraries, containing one sheet for each train.

As a means of identification, each train was given a number, which applied to its movement in both directions, but was not used as an operating number. Individual sheets in this book showed the identification number, temple name and designation, consist and itinerary of the trip, terminal movement at Miami and whether the train was to be vacated on arrival at the passenger station, or go to one of the parking locations. Supplementary sheets were issued as needed to cover changes in schedule, or for other reasons. For the going trip the sheets of the book were mimeographed on white paper; to prevent confusion a separate book on blue paper was prepared for the return trip. These books constituted the only data or instructions issued concerning the movement of special Shrine trains, and inasmuch as every essential detail was covered, and copies placed in the hands of all employees having anything to do with train operation, no confusion or misunderstanding was possible. It is felt that this book contributed largely to the practically perfect movement. The book was also valuable to ticket agents in enabling them to answer the many inquiries naturally arising on such an occasion.

Many of the temples did not desire to arrange their return itinerary until after their arrival at Miami. In order to take care of this, an office was established in the division superintendent's headquarters at Miami. This office was in charge of the inspector of transportation, an assistant general passenger agent and a representative of the Pullman Company. An electric mimeographing machine and operator were sent from the general office at Saint Augustine and produced the sheets for the return itineraries, as well as other necessary circulars and bulletins. The office was open continuously and was greatly appreciated by the Shriners, as it was called on to look after everything from a lost pair of trousers to the movement of one temple in five special trains to Key West.

An entire floor of an office building in Miami was turned over to the transportation committee of the local Shrine and used as general headquarters. A representative of the transportation department of the rail road was detailed to this office and a private wire run from it to the contact office in charge of the inspector of transportation in the superintendent's office.

The movement of the Shrine specials necessitated the preparation of 40 locomotives, nearly all of which had been recently withdrawn from service because of reductions in passenger trains at the end of the tourist season. Each engine was thoroughly cleaned, the boiler washed and boxes repacked; it was then run in freight service for one or two trips to insure its good operating condition. The northern engine terminal, located at Bowden, about five miles south of Jacksonville, was the assembling point for the locomotives. Here all the engines were accumulated, being sent there either in train service or in tow. Each engine was again carefully inspected, cleaned and all necessary minor repairs made to insure first class condition. A large Shrine emblem was attached to each side of each tender. This sign contained, beside the emblem in orange on a black background, the name of the temple and the train number.

The scheduled running time for the special trains from Jacksonville to Miami was nine hours, although a few specials were handled in eight hours, where this time was requested. Of the 39 special trains handled, 90 per cent arrived at destination on time and 92 per cent made better than scheduled time. Floods in southwest Georgia and western Florida caused delays on account of detouring that resulted in some of the special trains being received late from connections.

The Shrine specials were delivered to the Florida East Coast by the Jacksonville Terminal Company. Several hours before the first trains arrived, engines were put under steam at Bowden and sent, in groups of four or five, to south Jacksonville. At this point, which is a small terminal across the river from Jacksonville, used prior to the construction of the new Bowden terminal, a lounging room and call boards were provided for engine crews. When notified of the impending arrival of a special, a crew was called, an engine turned, and backed to Jacksonville by the road crew, coupled to the train, and proceeded on its run. Conductors and trainmen were called at Jacksonville as usual.

In order to safeguard this handling, an office car was placed at the Jacksonville terminal and used by the superintendent, master mechanic and other members of his staff, as office and living quarters. This car was fitted up with railway telephones and outside connection.

The heavy tourist traffic having ended only a few weeks prior to the date of the convention, no difficulty was encountered in getting together sufficient crews to handle this special movement. Men on the extra board were called back into service, and given a physical examination if the duration of their absence from the service required it. These crews were furnished with special instructions covering slow orders, and any other information it was necessary for them to have. There were sufficient men on the extra lists so that no men were called from other sources.

Parking at Miami

At Miami the locomotives of parked trains were handled at Buena Vista, a passenger terminal about two miles north of the passenger station. All trains and overflow cars which were vacated on arrival were taken by their crews to Hialeah, a new freight terminal about seven miles west of Miami.

Eighteen trains, with 189 cars, were parked and occupied during the convention, with 14 dining cars serving all meals for seven of these trains. The trains to be parked were not taken to the passenger station, but directly to their parking location. Here the trains were separated at the diners, which were in the center of the train, wooden steps to the diners set up, lights connected, and the trains were not disturbed again until departure time.

Shower baths for men and women were provided in temporary frame buildings at each parking location. The buildings were generally 10 ft. by 32 ft. and contained 14 showers.

Soap and towels were provided at a small charge, by

an outside concern which was granted the concession. Cinder walkways were provided between the tracks. These walks and the parked cars were lighted by motor generator sets connected to the city circuits and installed in freight cars or other temporary housing. Brackets were erected near the passageways of Pullman cars, and circuits plugged into the Pullman vestibule sockets. The appearances at the parking locations were greatly improved by having the sanitary cans hidden by means of burlap stretched along each car on the side next to the walkways. Each parking location also had an information booth in charge of a railroad representative with public telephone and taxicab stands.

On the return movement, parked trains left from their parking locations to avoid congestion at the passenger station. This worked successfully, except that some delays of a few minutes were caused by inability to move cars until departure time. This was especially true of trains parked on the Peninsular & Occidental dock, where all switching had to be done across Biscayne boulevard, which was crowded with automobile traffic day and night.

Dining car stewards and crews were housed at the railway company's bunk house at Buena Vista, which had accommodations for approximately 200 white employees; a building nearby was fitted up for the use of colored employees; and supervisory forces used an apartment house owned and operated by the railway.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading during the week ended July 21 amounted to 1,033,816 cars, an increase of 9,282 cars over the preceding week and of 21,231 cars as compared with loading in the corresponding week of last year but a decrease of 44,377 cars as compared with 1926. Loading of coal, grain and grain products, ore and miscellaneous freight was larger than a year ago. Coal loading, with a total of 151,441 cars, led the total in the corresponding week of last year by 1,039 cars. Loading in Pocahontas and Southern districts only showed a decrease as compared with a year ago. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, July 21, 1928

Districts	1928	1927	1926
Eastern	231,868	230,370	241,989
Allegheny	208,533	204,919	217,296
Pocahontas	55,267	57,114	60,790
Southern	139,615	149,521	150,254
Northwestern	159,251	154,653	166,939
Central Western	157,322	142,337	161,085
Southwestern	81,960	73,671	79,840
Total Western Districts	398,533	370,661	407,864
Total All Roads	1,033,816	1,012,585	1,078,193
Commodities			
Grain and Grain Products	55,247	48,131	61,799
Live Stock	23,247	24,919	27,540
Coal	151,441	150,402	184,410
Coke	8,760	9,924	11,268
Forest Products	64,989	68,034	71,687
Ore	64,501	64,287	74,916
Merchandise L. C. L.	255,731	256,385	254,401
Miscellaneous	409,900	390,503	392,172
July 21	1,033,816	1,012,585	1,078,193
July 14	1,024,534	1,017,394	1,076,372
July 7	850,605	839,085	897,556
June 30	1,003,049	1,021,438	1,065,641
June 23	986,789	1,018,060	1,055,362
Cumulative total, 29 weeks	27,366,060	28,390,104	28,385,353

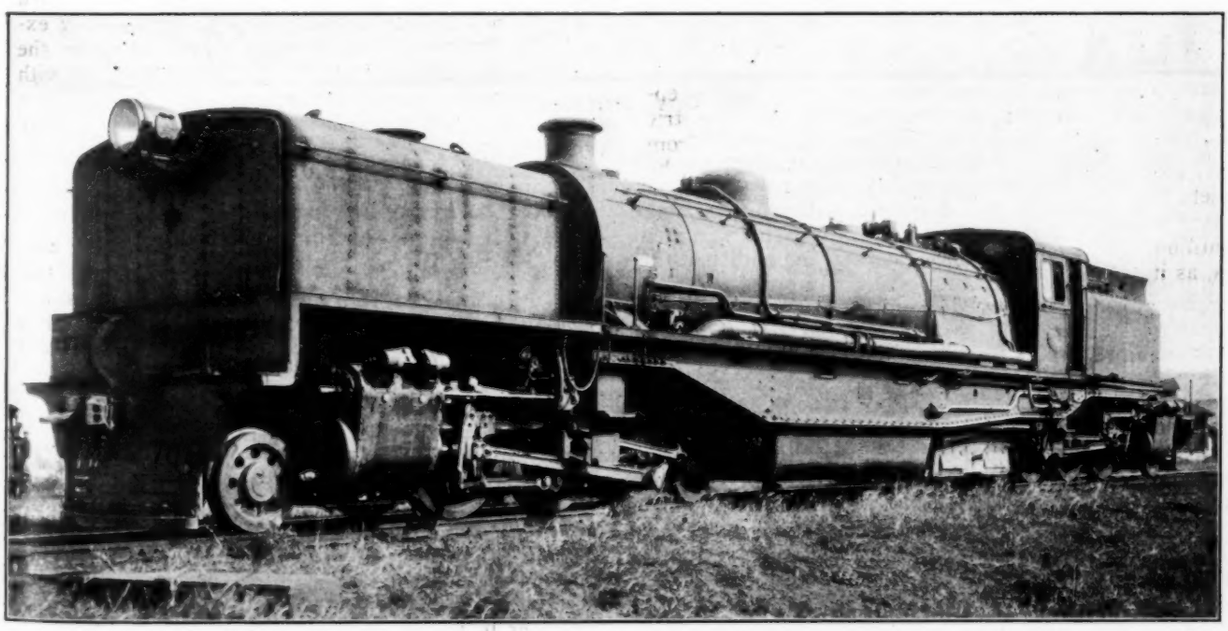
The freight car surplus during the period ended July 15 averaged 314,605 cars, as compared with 332,317 cars on July 8. The total included 151,426 box cars, 114,364 coal cars, 23,617 stock cars and 15,765 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended July 21 totaled 69,464 cars, an increase of 417 cars over the previous week and an increase of 6,960 cars over the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada		
July 21, 1928	69,464	37,654
July 14, 1928	69,047	36,331
July 7, 1928	60,160	33,255
July 24, 1927	62,504	36,755
Cumulative Totals for Canada		
July 21, 1928	1,863,733	1,127,390
July 23, 1927	1,756,602	1,106,570
July 24, 1926	1,664,076	1,079,747

* * * *



A Garratt Type Locomotive on the South African Railways

Great Northern Operates Efficiently

Well-planned program of improvements—line, grade, power, etc.—overcomes adverse factors and maintains earnings

THE Great Northern's operating revenues for the first six months of 1928 totaled $49,967,483—an increase of $2,183,254 over the same period last year. Operating expenses also show an upward tendency, yet net railway operating income for the period stands at $7,442,221, or $409,385 ahead of the first half of 1928. However, it is the latter half of the year when the road does most of its business (in 1927, 58 per cent of gross revenues and 76 per cent of net railway operating income were attributable to the latter half of the year). It is gratifying, therefore, to note that the shippers' advisory boards in its territory are estimating shipments for the third quarter of this year at upwards of 5 per cent greater than the same period last year.

Traffic Increase Not Rapid

In 1927 the Great Northern handled the biggest business, from a standpoint of ton-milage, in its history and yet the increase over 1918 was but 1.3 per cent. Coupled with this relatively slow growth in traffic there has been, in recent years, a declining tendency in earnings per ton-mile with higher wage rates. These unfavorable factors the management has countered with judicious capital expenditures designed to reduce operating costs, combined with the application of improved operating methods, which strategy has been so successful that operating net has surmounted its impediments, and climbed gradually, but steadily, upward in the years since federal control.

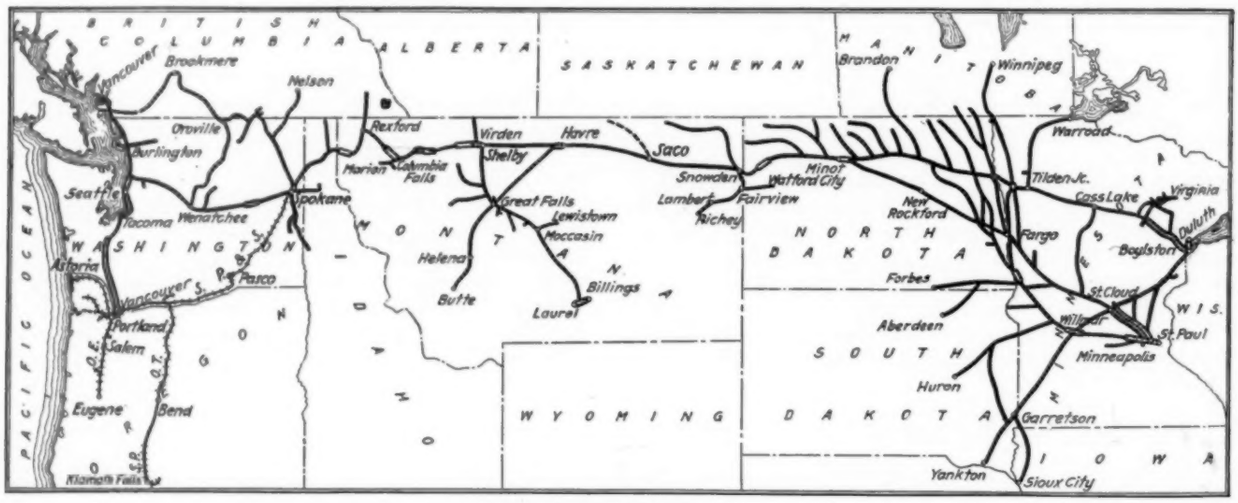
As has been stated above, revenue ton-milage was but 1.3 per cent higher in 1927 than in 1918. Furthermore, operating revenues were only 17 per cent greater last year than they were in 1918. Yet in spite of increases in wage rates and other costs since 1918, the Great Northern effected a reduction in operating expenses of 7 per cent, with the result that net operating revenue was more than twice as great in 1927 as it was in 1918.

It is not, however, necessary to go back as far as 1918 to make comparisons with 1927 to see wherein the road's greater efficiency has shown itself. The improvement during the past four years is sufficiently striking and, furthermore, serves even better to show that increasing efficiency is going on right up to the present time. In Table 2 selected freight operating statistics for 1924 and 1927 are given, showing the percentage of change. From this table it appears that the road moved 10.7 per cent more gross ton-miles in the latter year with an actual decrease of 4.2 per cent in train miles and 3.2 per cent in locomotive miles.

Average Daily Car Mileage Increased

Freight car-miles increased 9.4 per cent, with a decrease of 8.1 per cent in freight train-hours. Average daily car mileage increased 20 per cent, gross ton-miles per train hour increased 20.4 per cent and fuel efficiency was improved by 9.3 per cent.

How was this general stepping up in the economy of the whole transportation machine brought about? The answer must credit in large part additional investment for promoting operating economies. Investment in road and equipment increased $52,216,555 from 1922 to 1927.



The Great Northern

locomotives in service in 1923 compared with 1927 shows how material this change has been:

Type	No. in 1923	No. in 1927	Type	No. in 1923	No. in 1927
6-whl. sw.	100	96	4-8-2	43	43
8-whl. sw.	40	74	Prairie	125	96
Mogul	91	15	2-8-2	218	263
2-8-0	258	194	Santa Fe	22	30
4-4-0	88	52	2-6-6-2	37	0
4-6-0	129	74	2-8-8-2 Simple	0	6
4-8-0	101	93	2-6-8-0	36	35
4-4-2	10	10	2-8-8-0	25	25
4-6-2	104	136			

In 1927, 29 per cent of the locomotives were oil-burners, 56 per cent had superheaters, 23 per cent had stokers and 4 per cent were equipped with boosters.

In 1927 the Great Northern owned 54,746 freight cars of an average capacity of 87,707 lb., as compared with 60,204 with 80,577 lb. average capacity in 1923.

Important Changes in Line and Grade

Another form of capital expenditure which has had a direct bearing on operating economy has been line and grade revision. In 1927 a total of 25,655 ft. of line was relocated, eliminating 305 deg. of curves, 1437 ft. of bridges and 213 ft. of tunnel. In 1926 there were line changes involving about 2 miles in the vicinity of Glacier National Park which reduced the distance ½ mi. and eliminated 263 ft. of bridges and 5 curves. Many other line improvements have been made in recent years, but these two instances are mentioned because they are typical of a sort of work which is going on constantly—work which tends to lower not only unit transportation costs, but also expenses on maintenance of way and equipment. A program of bridge renewal, strengthening or filling goes forward each year. Short stretches of second track are laid at points of congestion. Two modern tie treating plants have been provided in the past two years. Several hundred miles of automatic block signals have been installed in the past few years, aiding in speeding up trains as well as making operation safer. The main line is equipped with automatic signals from St. Paul to the Coast. In 1925, by a grade reduction project 3 miles in length, the ruling grade against eastbound traffic on the entire Spokane division was reduced to 0.4 per cent. Ore handling facilities at Allouez, Wis., have been rebuilt, the work extending over a three-year period.

Of all these improvements, however, the most outstanding is the change of line, provision of a new tunnel and extension of electrification in the Cascades, which project should be virtually completed this year and which should result in further important operating economies. This project has been fully outlined in previous articles in the *Railway Age*.

Depreciation Rate Increased

It has been stated that 1927 was a peak year for the Great Northern from a standpoint of net ton-miles. This was not the case with operating revenues. However, they were larger than in any year since 1923, the figure being $117,904,005 as against $117,383,909 in 1926—the best previous year since 1923. Net revenue, however, declined $2,550,020 from the previous year's figure of $42,098,445. The increase in operating expenses which brought this about came in maintenance of way expenses, $672,096, and maintenance of equipment, $2,237,714. The increase in the latter item was almost entirely due to a change in the basis of depreciation from 2 per cent to 4 per cent, made effective in 1927. Wage increases granted during the year amounted, on an annual basis, to approximately $950,000.

The road has consistently followed a policy of ballast and tie renewal and rail relaying during the past few years. In the past five years it has increased its first track mileage of 130-lb. rail to 67.5 miles; 110-lb. to 149 miles; 100-lb. to 190 miles and 90-lb. to 2,992 miles. All new ties placed in track are treated.

Table 2—Comparison of Selected Freight Operating Statistics*

	1927	1924	Per cent of change Inc.	Dec.
Mileage operated	8,164	8,251		1.1
Gross ton-miles (thousands)	21,731,621	19,638,877	10.7	
Net ton-miles (thousands)	10,114,432	9,371,386	7.9	
Freight train-miles (thousands)	10,056	10,493		4.2
Freight locomotive-miles (thousands)	10,999	11,358		3.2
Freight car-miles (thousands)	547,187	500,140	9.4	
Freight train-hours	869,826	946,551		8.1
Tons of coal consumed by freight locos.	1,538,504	1,523,685	0.9	
Car-miles per day	27.8	23.2	20.0	
Net tons per loaded car	28.2	28.3		0.4
Per cent loaded to total car-miles	65.5	66.1		1.0
Net ton-miles per car day	513	435	18.0	
Freight cars per train	55.4	48.6	14.0	
Gross tons per train	2,161	1,872	15.4	
Net tons per train	1,006	893	12.7	
Train speed, miles per train hour	11.6	11.1	5.0	
Gross ton-miles per train-hour	24,984	20,748	20.4	
Net ton-miles per train-hour	11,628	9,901	17.4	
Lb. coal per 1,000 gross ton-miles	127	140		9.3
Loco. miles per loco. day	43.4	40.3	7.7	
Per cent freight locos. unserviceable	19.9	19.8	0.5	
Per cent freight cars unserviceable	5.6	6.7		16.4

* Bureau of Railway Economics Reports.

Ratios of maintenance of way, maintenance of equipment and transportation expenses to operating revenues for the past five years are as follows:

Percentage of Operating Revenues

	Maintenance of Way	Maintenance of Equip.	Transportation
1923	12.7	18.1	37.6
1924	12.6	15.5	35.4
1925	12.4	14.9	33.4
1926	12.0	15.2	31.8
1927	12.6	17.0	31.8

Traffic Diversified

Table 3 gives the percentages of important commodities and classes to total traffic handled. The comparison of tonnage handled with ton-mileage in different years varies widely by reason of differing lengths of haul on various commodities. Traffic is quite widely diffused—with ore tonnage bulking large, however. The volume of this commodity, as the table shows, is relatively uniform and is a stabilizing influence in a traffic structure which might otherwise show greater fluctuation from year to year if dependent to a larger degree on agricultural production. Aside from this,

Table 1—Great Northern Operating Results, Selected Items, 1916-1927

Year ended Dec. 31	Mileage	Revenue tons	Revenue ton miles (thousands)	Average haul	Revenue per ton mile cents	Revenue train load	Avg. Revenue car load	Total operating revenues	Total operating expenses	Net operating revenue	Operating ratio	Net after charges
1916	8,098	30,389,386	8,018,210	264	0.761	661	22.65	$83,181,729	$48,569,202	$34,612,528	58.39	.....
1917	8,233	30,650,814	8,399,349	274	0.766	671	23.72	88,598,735	59,282,156	29,316,578	66.91	$23,040,172
1918	8,260	30,948,659	8,844,787	286	0.870	684	25.89	100,698,520	84,429,245	16,269,275	83.84	20,063,270
1919	8,220	27,390,432	7,973,569	291	0.970	663	24.66	106,562,145	86,786,273	19,775,871	81.44	22,139,586
1920	8,174	32,948,292	8,518,841	259	1.054	684	25.34	122,597,865	113,947,115	8,650,751	92.94	19,304,097
1921	8,163	19,533,134	5,740,921	294	1.301	607	23.31	101,317,204	80,496,912	20,820,291	79.45	28,469,926
1922	8,261	27,450,587	6,882,465	251	1.134	656	23.96	103,452,937	79,636,038	23,816,899	76.98	10,865,672
1923	8,254	36,385,396	8,754,273	241	1.070	712	25.31	120,077,771	86,750,523	33,327,248	71.21	18,067,947
1924	8,251	31,669,750	8,093,136	256	1.064	770	24.58	110,243,104	75,212,058	35,031,045	68.2	17,941,600
1925	8,242	33,494,620	8,517,914	254	1.058	830	24.79	114,924,960	75,827,288	39,097,672	66.0	21,435,396
1926	8,188	35,117,929	8,902,970	254	1.048	873	27.67	117,383,909	75,285,464	42,098,445	64.1	25,943,258
1927	8,164	33,843,008	8,958,350	265	1.054	891	27.96	117,904,005	78,355,579	39,548,425	66.5	22,985,923

perhaps the most interesting trend shown in the table is the slow but steady increase in the products of manufactures—an increase natural enough, but nevertheless important and worthy of notice.

The Passenger Traffic Problem

In common with almost all railroads, the Great Northern is continuing to feel the competition of automobiles in its passenger train earnings, which were

Table 3—Percentage of Various Classes of Traffic to Total Revenue Tonnage

	1923	1924	1925	1926	1927
Wheat	7.8	9.1	7.5	7.0	9.1
Products of Agriculture	17.5	20.9	17.5	15.1	18.0
Animals & Products	1.4	1.7	1.8	1.7	1.6
Bituminous Coal	7.8	8.2	8.4	8.2	9.1
Iron Ore	48.6	42.7	44.2	46.8	43.1
Total, Products of Mines	61.0	56.2	57.8	60.1	57.3
Products of Forests	11.3	11.0	12.0	11.7	10.9
Manufactures & Miscellaneous	7.1	8.4	9.1	9.7	10.4
L. C. L.	1.7	1.8	1.8	1.7	1.7

Tons of revenue traffic totaled 36,385,396 in 1923; 31,669,750 in 1924; 33,494,620 in 1925; 35,117,929 in 1926; 33,843,008 in 1927.

$18,619,852 in 1927—1.9 per cent lower than in 1926. Its earnings from this service were 34 per cent lower in 1927 than in 1920. The Great Northern, on the other hand, was a pioneer among the railways to begin the operation of highway motor coaches, and these at the end of 1927 were covering 2,733 route miles. The highway operations are carried on by a subsidiary, the Northland Transportation Company, and in 1927 a total of 2,596,692 passengers were transported in its coaches—within a half-million of the number of passengers carried by the railway. The Northland's traffic showed an increase of 31 per cent in 1927 over the preceding year, a portion of this increase, however, being due to the operation of additional route mileage. The services of the Northland's coaches are co-ordinated with those of the Great Northern's trains to the mutual advantage of both.

The Great Northern, which has a large branch line mileage, has also utilized the rail motor car to reduce its operating costs. At the end of 1927 it had 25 motor cars and trailers which made a mileage of 1,298,811 passenger train miles during the year—almost twice the 1926 total. In November, 1927, passenger train service of the Great Nothern, the Northern Pacific and the Minneapolis, St. Paul & S. Ste. Marie between the Twin Cities and the Head of the Lakes was pooled, which will save the Great Northern alone 117,000 train miles annually. Pooled service is likewise operated between Seattle, Wash., and Portland, Ore., by the Great Northern, the Northern Pacific and the Union Pacific.

30 Per Cent of Income From Investments

The Great Northern, in addition to its earnings from its railway operations, has an important source of income in its investments in other companies, its 1927 balance sheet showing $240,591,194 of its assets so placed, as compared with $494,491,314 in its own road and equipment. In 1927 its dividend income was $9,663,283 and its income from other sources brought its total non-operating income up to $12,838,273, or 30 per cent of its gross income. The companies in which it is most heavily interested are the Chicago, Burlington & Quincy, the Spokane, Portland & Seattle (control of both of which is shared by the Great Northern and the Northern Pacific) and the Montana Eastern.

The Great Northern in 1927, after earning its fixed and other charges more than twice over, had left $9.23 per share of stock, as compared with $10.42 the preceding year. Its regular dividend rate is 5 per cent and earnings have exceeded this figure substantially every year since 1922.

Valuation Gives Stock $200 Equity

The Interstate Commerce Commission in November last year issued an order declaring the "final value" of the Great Northern and its subsidiary and affiliated companies, which figure the company does not accept, but which shows an equity in excess of $200 per share for the road's stock.

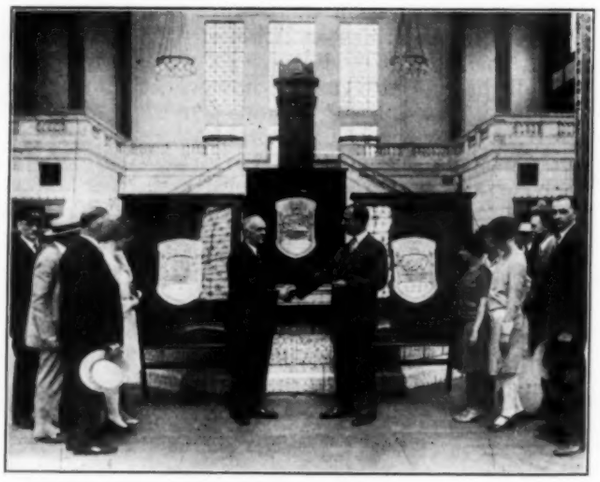
To reimburse its treasury for capital expenditures the road in 1927 issued and sold $20,000,000 of its 4½ per cent general mortgage bonds. During the year it acquired and redeemed funded debt totaling $10,686,300.

In May of the current year operation was begun between Portland, Ore., and Klamath Falls, marking the opening up of a territory which should eventually produce a considerable traffic. Another new line is being constructed northwest from Saco, Ore.

The Interstate Commerce Commission now has pending before it applications for approval of a plan to unify the Great Northern, the Northern Pacific and the Spokane, Portland & Seattle. Extensive testimony both for and against the applications has been presented. The closing date for the filing of briefs is at hand and final presentation by oral argument may be expected at an early date.

AN INJUNCTION perpetually enjoining and restraining a partially blind man from singing and soliciting contributions on Louisville & Nashville passenger trains was issued on June 30 by the civil district court at New Orleans, La. The railroad company charged that the man had ridden at regular intervals as a passenger and made a practice of going through the coaches singing and holding out his hat or other receptacles for the purpose of obtaining contributions from passengers, thereby creating a nuisance.

* * *



Record Safety Victory in Chicago Territory

Three of the five President's Safety Trophies offered by President W. W. Atterbury of the Pennsylvania Railroad for the best departmental records in accident prevention have been won by the Western Region, with headquarters in Chicago. The three trophies have just been placed on exhibition in the Union Station, where they are attracting much attention. H. E. Newcomet, general manager of the Western Region of the Pennsylvania Railroad, Chicago, (right) is shown here congratulating Frank E. Strouse, director of safety. Of the five trophies awarded by President Atterbury for the best no-accident showing in the engine service, maintenance of equipment, train service, station forces, and maintenance of way service, the Pennsylvania's Western Region won the latter three.

The Utilization of Freight Cars *

Possibility of decreasing empty car mileage if a larger number of cars are available

By C. B. Peck

Managing Editor, Railway Mechanical Engineer, New York

TO accomplish the utmost use of each unit of equipment, the principal objectives, so far as the operating department is concerned, are prompt movement and the heaviest practicable loading per car. The promptness of movement, however, as measured in miles per car-day, has markedly increased, and the result has been a progressively improving service to the public both in the promptness with which cars have been furnished for loading and the dispatch with which they have been moved to destination. Prior to and including 1920, each succeeding year of peak traffic was a year of congestion and heavy car shortages. In 1923, in which the net ton-miles handled exceeded the traffic of 1920 by 2 per cent, car shortages, although still present, were less severe in their effect. In 1926, the most recent peak year, with eight per cent more net ton-miles than in 1920, car shortages had, practically speaking, disappeared entirely. This is a record with which the railroads and shippers alike may be proud.

So much for the character of the public service rendered by the railroads. What has been the effect on the roads themselves? What tendencies has this effort set in motion and how are they likely to affect the future?

The first factor to be considered is net ton-miles, which is the measure of the business handled. The next is the number of cars on line in which the ton-miles have been produced. The next is the number of car-miles required to handle the business, classified as loaded miles and empty miles.

Fig. 1 shows the proportion to which the car load has dropped off since 1920 and how the car-miles per car-day have increased at a much greater rate than the business handled, having increased by 12 per cent in 1923 and 21 per cent in 1926, whereas the volume of business moved had increased by two and eight per cent in those two years, respectively. The net ton-miles per car-day is merely an indication of the relation between the gross business handled and the aggregate supply of cars and, beyond this indication, is of little significance.

One of the most interesting points in connection with the car performance is the trend in empty car-miles. Referring to Fig. 2, it will be seen that in 1921 when business declined materially from the preceding year, the aggregate amount of empty car milage had increased slightly. It fell off in 1922, but not in proportion either to the amount of business or the loaded car-miles, and since that year has continued to increase steadily with the exception of an insignificant decline in 1924. In 1923, with its slight increase in business over 1920, empty car mileage had increased 18 per cent; in 1925, with practically the same volume of business, it had increased 28½ per cent, and in 1926, had increased 40 per cent over 1920. Despite the decline in the volume of business handled in 1927, the number of empty car miles had still further increased to 42 per cent over 1920. This, then, is the explanation for the greater proportionate increase in car-miles per day than in loaded car-miles and in the maintenance of practically the same number of miles per car-day in 1927 as in 1926, despite a decline in business and a similar decrease in the number of loaded car-miles.

In 1920 there was an average of 47.3 empty car-miles for each 100 loaded car-miles. As the result of the marked increase in empty car-miles, there has been, with the exception of 1921, a steady increase in this ratio to 52 in 1923, to 57 in 1926, and to 59 in 1927. This is the price which the railroads have paid to make a car supply, which, in 1926, was only about two per cent greater than in 1920, handle a traffic eight per cent greater that in 1920, and to handle it without car shortages.

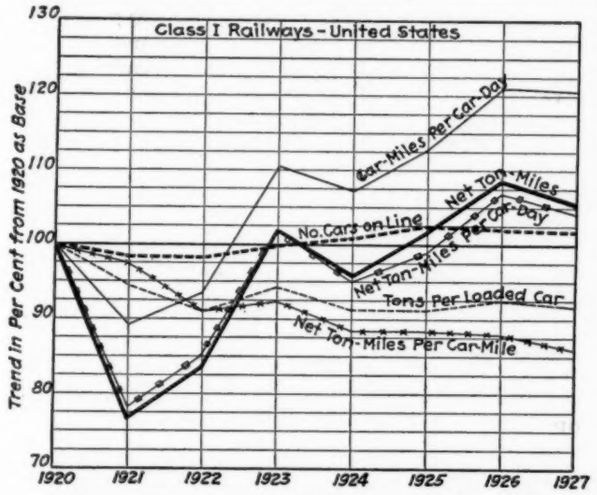


Fig. 1—Trends in Car Performance Since 1920

How it was accomplished may become at least partially evident by examining the trend in the percentage of cars owned which are at home on the lines of the owning roads. This in shown in Fig. 3. The curve does not show all of the minor fluctuations reported, but does show major swings and all of the critical points. At the termination of Federal control in 1920, the freight cars of the carriers were so badly scattered that but 22 per cent were in the hands of the owners. Much the same condition had prevailed throughout the period of Federal control. This was followed by a tremendous home movement late in 1920 and early in 1921, to the effect of which attention has already been called in the increase in empty car mileage which took place in 1921 in spite of a severe decline in traffic. A high point was reached in January, 1922, when 75.9 per cent of the cars were in the hands of the owners. In 1922, with the coal miners' strike beginning on April 1 and the shopmen's strike beginning on July 1, the cars were again considerably scattered and but 46½ per cent were in the hands of the owners when the downward trend was checked in November.

* Abstract of the first part of a paper contributed by the Railroad Division and presented at the Spring Meeting of the American Society of Mechanical Engineers, Pittsburgh, Pa., May 14, to 17, 1928.

In the face of this unsatisfactory distribution of cars, the railroads handled the largest volume of business ever handled up to that time in the same length of time, and at the same time effected a gradual improvement in the location of the cars. During 1924 and 1925 the conditions with respect to car location remained fairly constant at a point averaging somewhere between 65 and 70 per cent, with maximums over 70 per cent and minimums not much under 60 per cent. It is worth noting that during the latter year, with a total volume

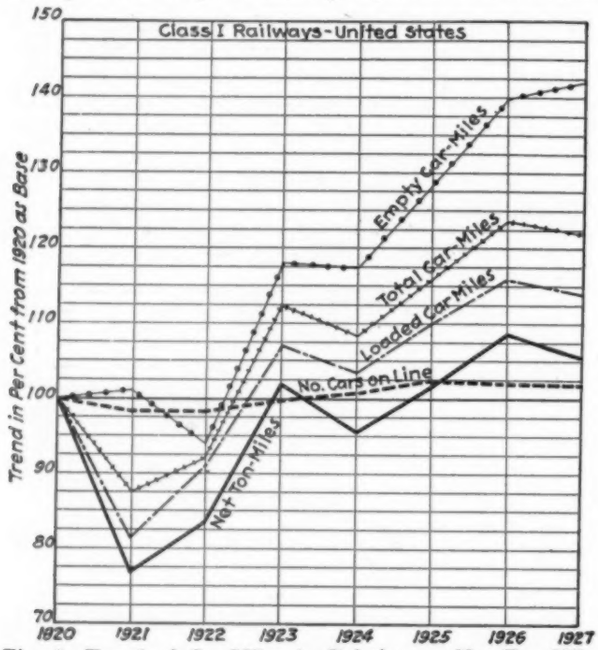


Fig. 2—Trend of Car-Miles in Relation to Net Ton-Miles Since 1920

of traffic practically the same as for 1923 and a fairly uniform distribution of cars, falling off slightly during

Table 1—Freight-Car Performance

Year	Net ton-miles (000,000)	Freight car-miles (000,000) Total	Empty	Loaded	Empty in per cent of loaded	No. freight cars on line	Per cent of ownership	Per cent unserviceable
1920	449,125	22,607	7,259	15,384	47.3	2,469,000	104.4	7.0
1921	344,343	19,819	7,335	12,484	58.7	2,425,000	103.6	13.2
1922	375,617	20,808	6,831	13,977	48.8	2,426,000	105.0	12.8
1923	457,590	24,993	8,569	16,424	52.0	2,463,000	106.3	8.0
1924	429,453	24,448	8,535	15,913	53.6	2,486,000	106.2	7.8
1925	456,265	26,230	9,323	16,907	55.1	2,526,000	106.6	7.7
1926	488,578	27,974	10,154	17,820	57.0	2,520,000	106.8	6.5
1927	474,683	27,791	10,312	17,479	59.0	2,509,300	107.0	5.9

the heavy traffic period in the Autumn, the empty car-miles had increased materially over the number required in 1923, when a marked redistribution of equipment was effected in the face of heavy traffic.

Looking at this curve for the major trends— that is, disregarding the seasonal fluctuations—it is evident that since 1922 cars must have been promptly returned to the owning roads—loaded if possible, but without holding for loads—to maintain the relatively high percentages of cars in the hands of the owners which have prevailed since 1924.

A study of Figs. 1 and 2 shows that for the country as a whole car-miles per day implies something which is not always kept in mind when using this figure. With a total car supply which varies but slightly from year to year, car-miles per day varies in proportion to variations in total car-miles. The use of this figure, then, as a measure of overall effectiveness of car utilization places a premium on empty car-miles, which tends to swell the total without actually producing any net ton-miles of revenue movement.

As an indication of what, from a purely operating standpoint, may be considered as a measure of the efficiency with which cars are used, I believe it is permissible to divide the total number of net ton-miles

Table 2—Freight-Car Performance—Averages

Year	Average weight per car, tons	Average car capacity, tons	Net tons per loaded car	Car-miles per car-day	Net ton-miles per car-day	Net ton-miles per car-mile
1920	20.1	42.4	29.3	25.1	498	19.9
1921	20.4	42.5	27.6	22.4	389	17.4
1922	20.5	43.1	26.9	23.5	424	18.1
1923	20.7	43.8	27.9	27.8	509	18.4
1924	20.9	44.3	27.0	26.9	472	17.6
1925	21.1	44.8	27.0	28.3	493	17.6
1926	21.4	45.1	27.4	30.4	532	17.5
1927	21.6		27.2	30.3	518	17.1

moved by the total number of car-miles, empty and loaded combined, to see how much revenue-producing service each car-mile is rendering. The trend in this unit is shown in one of the curves on Fig. 1. It will be seen that this has been constantly declining since 1923.

This does not mean that car-miles per day is not a good unit when applied to individual railroads because it immediately reflects changes in the number of cars on the line, which do not take place when considering the roads as a whole. An accumulation of cars increases the divisor and, therefore, decreases the quotient, other conditions being equal.

How the number of cars on line affects the trend in car-miles per day is indicated in the graphs for the New England and Pocahontas regions, respectively, on Figs. 4 and 5. In the former a marked decrease in the number of cars on line from 1924 to 1927, inclusive, had a material influence in causing a proportionately much larger increase in the miles per car-day than took place in the number of car-miles. In the latter case it will be seen how an increase in the number of cars on line since 1920 has reduced the proportionate increase in car-miles per day below the proportionate increase in the number of car-miles.

While the curves show that empty car-miles are increasing much more rapidly than the aggregate service required from the total supply of freight cars, it must be remembered that what has been shown is the relationship of various trends, which does not in any way indicate the relative importance, or "weighted value" of the factors they represent in their effect on operating economy. This may, in a measure, be judged by the trend in the ratio of empty to loaded car-miles, in Fig. 3, or by the relationship between loaded car-miles and total car-miles as shown on Fig. 2.

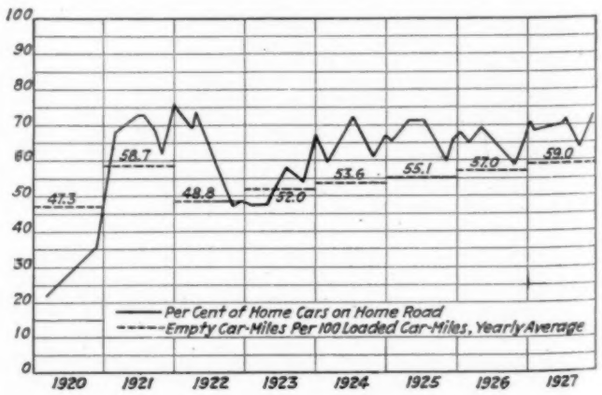


Fig. 3—The Location of Freight Cars with Respect to Ownership

There is another matter which must be considered before leaving the subject of freight-car utilization;

that is, the conditions of the freight-car equipment during the years under consideration. Have equipment conditions been one of the causes of the splendid service results, or has the intensive service been a cause for the equipment conditions? I think it will appear that the equipment conditions have been in a measure both cause and effect.

In considering the trend in car conditions the general character of the curve in Fig 3 showing the percentage of home cars on the owning lines should be kept in mind, remembering particularly the extremely low percentage which prevailed during 1920, the tremendous home movement late in 1920 and early in 1921, and the marked scattering of the equipment again during 1922. With this in mind, the curves on Fig. 6 will show what has been the condition of the equipment. The lower curve on this graph shows the number of hours of labor of men employed in car repairs paid for monthly by the Class I railroads. The figures are shown for a single month in each quarter of the year which I believe is sufficient to indicate the trend.

The upper curve shows the average yearly percentage of the cars owned which were unserviceable during the period. One may readily trace the effect of the 1922 strike with its accompanying scattering of the cars and disruption of the car department forces, and also the effect of the falling off of business in 1924 with the accompanying curtailment in the amount of labor devoted to car repairs. The striking thing about the situation, however, is the marked and steady decline in the percentage of bad-order cars since 1924, with the accompanying decline in the amount of labor devoted to the maintenance and repair of cars.

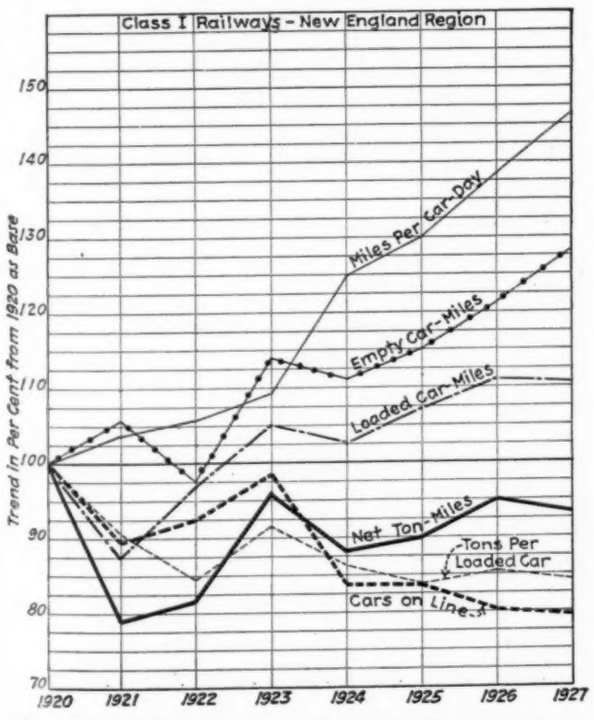


Fig. 4—Car Performance in the New England Region

It is evident that the intensive effort to rehabilitate freight cars, inaugurated in 1923, following the strike, has done more than merely to patch up the equipment, or the proportion of bad-order cars would not have continued to decline in the face of a decreasing amount of maintenance labor. Further evidence of this is also afforded by the fact (not shown on the diagram) that both the number of cars receiving heavy repairs and the number receiving running repairs has gradually declined through the same period. Had running repairs shown

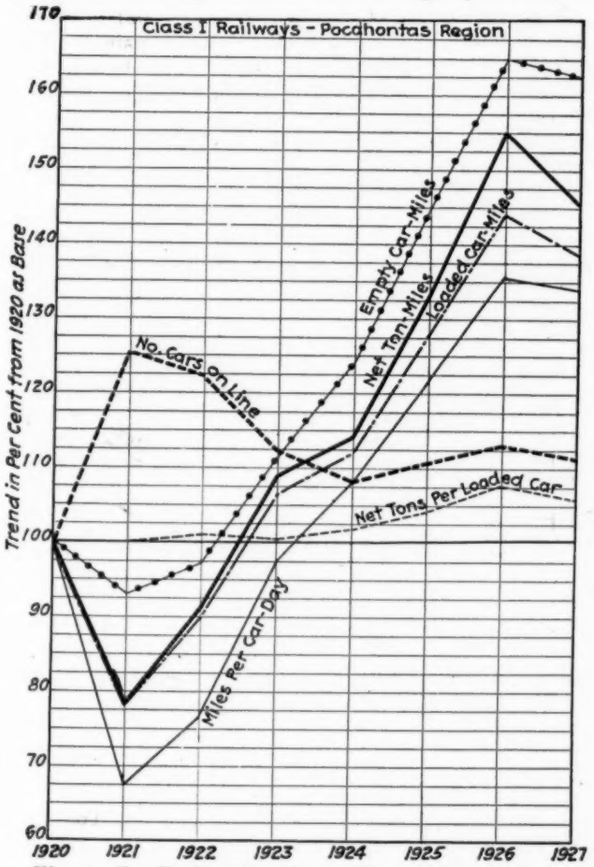


Fig. 5—Car Performance in the Pocahontas Region

a tendency to increase, it would indicate an accumulation of deferred maintenance, but the contrary is actually the case.

The increase in the car supply available for use indicated by the decline in the percentage awaiting or under repairs has played its part in the character of the service which the railroads have been able to render. The large proportion of the cars which have at all times been on the lines of the owning roads has, in turn, been one of the causes for the constantly improving condition of the equipment. The cost of maintenance tends to decrease as the percentage of cars at home increases. Each road does a thorough job to its own cars but makes only temporary repairs to foreign cars.

A number of cars equal to 80 per cent of the cars owned at the end of 1926 were installed during the 15-year period from 1911, 56.7 per cent in the 10 years since 1916, and 31.2 per cent during the six years since 1920.

Attention must be called to the fact that the number of cars installed does not represent the number actually built new. During the years since 1920 many of these installations represent cars retired from the records of the carriers, rebuilt, in the main with betterments, and reinstated on the books of the carriers. Something of the extent to which this was done may be evident from the fact that 232,000 cars were installed in 1923, while less than 100,000 were ordered during that year, and only 180,000 had been ordered from the builders during the preceding year. Two hundred fourteen thousand

cars were retired, however, in 1923, in the heavy rehabilitation program which followed the strike. A considerable percentage of these cars were undoubtedly rebuilt and reinstated.

How far were these reinstated cars improved with betterments? It is impossible to answer this question except in a very general way, without an actual inventory of the equipment. An indication, however, may

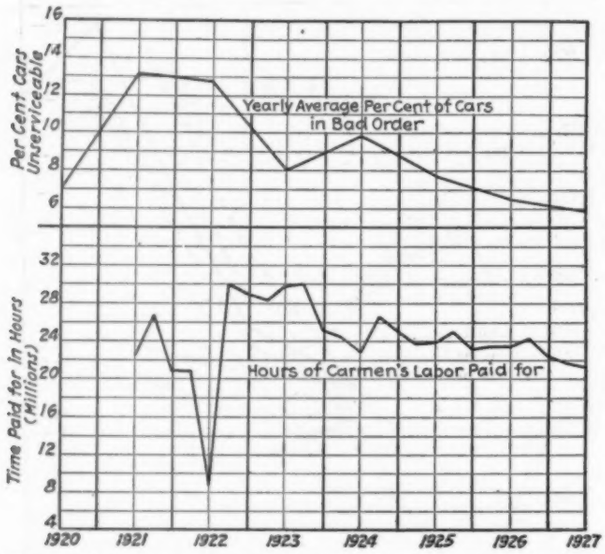


Fig. 6—Monthly Hours of Car-Repair Labor and the Percentage of Freight Cars Unserviceable

be obtained by examining the trend in the proportion of cars of all-steel or steel-underframe construction. In 1915, 52.1 per cent of all freight cars of railroad ownership were of all-steel or steel underframe construction. In 1920 this proportion had increased to 65.2 per cent, the increase having been maintained with a fair degree of uniformity throughout the five years. In 1925 this proportion had increased to 75 per cent, the trend again being fairly uniform.

The great bulk of freight cars of railroad ownership are included in two classes—box cars and open-top cars, or coal cars. In the former group are included between 46 and 47 per cent of the total ownership and in the latter, a little more than 40 per cent. In 1915, 38.6 per cent of all the box cars owned by the Class I railroads were of all-steel or steel underframe construction, mostly the latter. In 1924 this proportion had increased to 64.5 per cent and, in 1925, to 67.6 per cent. In the case of coal cars, 71.3 per cent were of steel or steel underframe construction in 1915, 89.1 per cent in 1924, and 90.5 per cent in 1925. These figures indicate a steady improvement in the character of construction which, of course, is a major factor in the ability today to maintain the equipment in a highly serviceable condition with a minimum of labor.

There is one other trend which it is worth while considering before concluding our attention to the freight-car situation. That is indicated by the curves in Fig. 7 which show the rate at which the average capacity and average weight of freight cars have increased since 1920. It will be seen that the two increases have almost coincided. It will also be seen that the proportion of average car capacity which is actually utilized has declined since 1920.

Returning for a moment to Figs. 4 and 5 illustrating the trend in freight-car utilization in the New England and Pocahontas regions, respectively, one may see what a relatively small part of the potential carrying capacity of the cars is actually utilized in territories where no coal originates and how the tendency is downward under such conditions. Starting with an average car load of 24.6 tons in the New England region in 1920, it has declined to 20.7 tons in 1927. The Pocahontas Region, on the other hand, is made up of coal-carrying railroads, and car loading in this region has increased from 42.1 tons in 1925 to 45.3 tons in 1926, with a slight decline to 44.9 tons in 1927. This represents the effect of the heavy coal movement which, as the graph indicates, has grown rapidly during the past few years.

It may be well to bring together in a brief summary the salient features of the situation. The car ownership of the Class I railroads has shown little tendency either to increase or decline since 1920. It has been supplemented by a slightly increasing proportion of cars of private ownership, mostly of special types such as refrigerator and tank cars. The physical condition of the equipment has steadily improved, large numbers of cars having been rebuilt with betterments by the carriers, notably in 1923. With each succeeding increase in business, this fairly constant number of cars has rendered a slightly increasing amount of service, but the promptness of the service has increased very materially. More car loadings have been required because of the decline in the average load. This improved service has been effected at the expense of a marked increase in empty car-miles. This increase in the proportion in 1926 over that in 1920 required the operation of approximately 3.5 per cent more freight train-miles and, in 1927, approximately 4.4 per cent more train-miles than would have been necessary had the 1920 ratio of empty to loaded car-miles prevailed in those years. The aggregate cost of this extra car mileage was about $100,000,000 in 1926 and $120,000,000 in 1927. The average freight-car capacity and weight continue to increase steadily, while the average car load has declined since 1920. There is little reason to expect it again to increase and the very efficiency with which the carriers are serving the public suggests the possibility of a further decline, from reductions in size

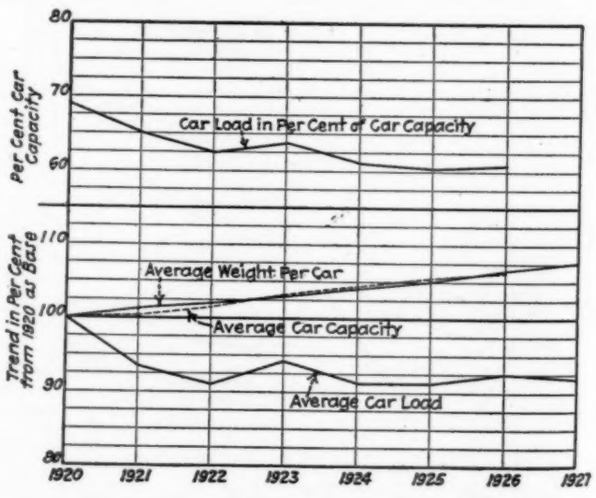


Fig. 7—Car Loading in Relation to Car Capacity

and increases in the frequency of merchandise shipments.

Shall this condition continue unchecked? May it not be possible that some of the increased empty car mileage could be traded at a profit for more cars? May it not be time for car designers to study the problems of weight and capacity, particularly of box cars, in the light of changing conditions?

C. & O. Asks Change in I. C. C. Orders

Wants to issue stock at par and pay more for Pere Marquette

WASHINGTON, D. C.

IN two petitions filed with the Interstate Commerce Commission on July 29 the Chesapeake & Ohio asked a reconsideration and modification of the order in which the commission authorized it to acquire stock of the Pere Marquette at not to exceed $110 a share for the common, so as to authorize it to pay $133.33 a share for 174,900 shares held by the New York, Chicago & St. Louis, and also of the order which authorized it to issue 200,000 shares of C. & O. common stock for the purpose, for subscription by its stockholders, at $150 a share, so that it may issue 300,000 shares at par.

Separate Petition Filed Dealing with Right to Issue Stock at Par

A separate petition dealing solely with the question of the right to issue stock to stockholders at par is filed, the petition says, "since it believes that the commission's action in fixing at a premium the price of the shares of stock in this case involves fundamental questions of law and serious questions of policy."

In the petition relating to the Pere Marquette the C. & O. points out that the price of $110 a share was that originally fixed in an option from the Nickel Plate Company, which, as was brought out at the hearings, the Nickel Plate declined to extend beyond July 1, 1927, a date shortly following the conclusion of the hearings. The Nickel Plate is now willing to sell at $133.33, with adjustment of dividends so that cash dividends accrued since April 2, 1928, at not exceeding 8 per cent shall go to the Nickel Plate, and stock dividends and any cash dividend in excess of 8 per cent shall go with the stock, in accordance with a letter from W. L. Ross, president of the Nickel Plate, dated June 12, 1928, to W. J. Harahan, president of the C. & O.

C. & O. Desires to Acquire Nickel Plate's 174,900 Shares of Pere Marquette

The C. & O. says it has not since the entry of the commission's order acquired any shares of Pere Marquette stock but that it desires to acquire the 174,900 owned or controlled by the Nickel Plate and such additional shares, including those it may acquire from the Virginia Transportation Company and the Vaness Company, pursuant to the authorization of the commission, as will constitute at least a numerical majority of the stocks and control of the Pere Marquette.

It is pointed out that the Pere Marquette common stock has greatly increased in market value since the original option at $110 was obtained and the price of $133.33 is said to be justified by the market quotations since January 1, 1928, ranging from a low of 124⅞ in February to a high of 146 in April and May. The acquisition of the 174,900 shares from the Nickel Plate, together with those held by the Virginia Transportation Company and the Vaness Company at the prices fixed by the commission's order of May 8, the petition says, will result in the C. & O.'s acquiring the shares at an average cost to it of only $122.191 per share.

In the separate petition on the question of the C. & O. stock issue it is declared that this is the first and only case in which the commission has imposed such a requirement that stock be issued at a premium "and thus substituted its judgment for that of the carrier."

"Not only is it true that prior to the decision in this case the commission in a number of cases authorized the issuance of stock having a market value substantially in excess of par to the stockholders at par, and thus did not require the issuance at a premium, but even since the decision in this case it has followed this rule, in authorizing the issuance of stock at par to the stockholders of the New York Central Railroad Company," the petition says.

The C. & O. had asked authority to issue $59,502,400 of its common stock at par, setting forth that its financial program for 1927 and 1928 contemplated the expenditure of $115,731,925, part of which would be obtained from the proceeds of the issue. This program included the expenditure of $22,507,488 for Erie stocks and $30,317,298 for Pere Marquette stocks, but the commission disapproved the proposed acquisition of the Erie and authorized the issuance of only 200,000 shares at $150, stating that the applicants might, if found necessary, submit a supplemental application for authority to issue additional stock for the purpose of acquiring a majority stock interest in the Pere Marquette.

Some extracts from the petition relating to the question of issuing stock at par or at a premium are as follows:

George S. Kemp, chairman of the minority stockholders' committee of the C. & O., has sent to the commission copy of a letter addressed to President Harahan expressing opposition to the payment of more than $110 a share for Pere Marquette common, stating that at a price of $130 the earnings of the Pere Marquette would represent a return of 9.22 per cent and that "it would not be difficult to show where the Chesapeake & Ohio could invest its funds to much better advantage."

Previous Decisions

As to such decisions prior to the decision in this case, see for example Stock of Atlantic Coast Line R. R., 117 I. C. C. 457 (1926). There the carrier was authorized to issue $13,756,500 of common stock, to be offered to its stockholders at par ($100) on the basis of one share of such stock for each five shares of stock held. The stock was then selling for over $200 per share, a price substantially in excess of the present market price of Chesapeake & Ohio stock, namely about $180 per share. As to the purpose of the stock issue in that case the Commission said: "The applicant states that it is proposed to use the proceeds of its stock for its corporate purposes, including extensions of its lines and additions and betterments to its property, the details of which it is not now in position to furnish."

Again in Stock of A. T. & S. F. Ry., 131 I. C. C. 744 (January, 1928), the Commission authorized the issuance of $9,296,400 of stock to be sold to stockholders at par, when the stock of the company was selling at prices in excess of $186 per share.

Some of the other cases in which the Commission, prior to the decision in the present case, authorized new stock to be sold to stockholders at par, although the stock had a market value substantially above par, are: Stock of Southern Railway, 117 I. C. C. 191 (1926); Stock of New York Central R. R., 131 I. C. C. 96 (1927); and Stock of Pennsylvania Railroad, 138 I. C. C. 452 (April, 1928).

In Stock of New York Central R. R., F. D. No. 6935, decided July 10, 1928, after the decision in the present case, the Commission authorized The New York Central Railroad Company to issue $42,158,300 of capital stock to be sold to the stockholders of that company at par, although the market price of the stock was approximately $170 per share, or only about 10 points lower than the Chesapeake & Ohio stock.

The fact that the Commission has uniformly permitted the issuance of stock to stockholders at par, although such stock had a market value substantially above par, is strong evidence of the reasonableness of such a practice. To depart from the rule so uniformly followed and having the sanction of administrative action should, it is submitted, require strong and convincing reasons. These, as will be pointed out later, do not exist in the present case.

As later pointed out, it is to be observed that the Commission has in numerous cases, resting upon principles carefully considered and decided by the Commission, authorized the issuance of stock to stockholders, not to be sold at par as in the present case, but to be issued to them as stock dividends.

While great latitude is undoubtedly permitted in administering the statute according to particular facts in a particular case, nevertheless it is elementary that as far as practicable the laws should operate on all alike. For example, the Supreme Court, in referring to the due process clause of the Constitution, has said: "Due process of law within the meaning of the amendment is secured if the laws operate on all alike, and do not subject the individual to an arbitrary exercise of the powers of government."

Aside from any question which might be raised as to the constitutionality of discriminating against the Chesapeake & Ohio in requiring the issuance of stock at a premium while permitting the issuance of stock at par in other cases, it is reasonable to believe that reconsideration by the Commission of the facts in this case and comparison of them with the facts in the other cases would lead unhesitatingly to the conclusion that it would be unjust and unreasonable to require the stock of this Company to be issued at a premium.

That the Commission has been given broad powers over the issuance of securities by railroads is beyond question, but as both the Commission and the Courts have pointed out, these powers are subject to statutory and constitutional limitations and are to be exercised within reasonable bounds and in conformity with the evidence.

It would be an unconstitutional delegation of authority for Congress to invest the Commission with unlimited powers to decide as it might please what issuance of securities should be and should not be permitted.

The standards within which the Commission's authority over the issuance of securities is to be exercised are set forth in Section 20a, paragraph (2). It is there provided that the action of the Commission shall be taken.

"after investigation by the Commission of the purposes and uses of the proposed issue and the proceeds thereof."

Note that there is no suggestion of investigation of market prices or of the premium at which securities might sell.

The section further provides that the Commission shall make its order authorizing the issuance of securities by a railroad:

"if it finds that such issue * * * (a) is for some lawful object within its corporate purposes, and compatible with the public interest, which is necessary or appropriate for or consistent with the proper performance by the carrier of service to the public as a common carrier, and which will not impair its ability to perform that service, and (b) is reasonably necessary and appropriate for such purpose."

Paragraph (3) authorizes the Commission to grant the application for issuance of securities:

"with such modifications and upon such terms and conditions as the Commission may deem necessary or appropriate in the premises."

This clearly, however, does not give unlimited authority to prescribe terms and conditions, because if this were so there would be an unlawful delegation of legislative authority. The provisions of paragraph (3) are plainly subordinate to paragraph (2) and are limited by the standards of that paragraph.

A Question of Management

It follows from what has been said that, in view of the importance of preserving untrammeled the right of management and of encouraging private initiative, the powers of the Commission should be exercised sparingly and only where the rights of the public are encroached upon. Such a construction of the statute would, we submit, make the requirement that the C. & O stock be issued at a premium not only unwise and inexpedient, but in excess of the statutory authority vested in the Commission.

As set forth above under the heading "Findings of the Commission" it is clear that the Commission has formally found that the "objects" of the issue are "within the corporate purposes of the applicant," "compatible with the public interest," "necessary or appropriate for or consistent with the proper performance by it (the C. & O.) of service to the public as a common carrier" and are such that they "will not impair its ability to perform that service." The "objects" therefore are found to be in compliance with the statute.

It is to be observed, as previously pointed out, that the Commission says that the stock is to be issued either for the purpose of providing $30,000,000 to acquire Pere Marquette stock *or* to "apply the proceeds, or such part thereof as may be required, to the discharge of its interest-bearing obligations, or to the expenditures chargeable to capital account and not previously capitalized." The Commission goes on to say "the issue authorized will rest upon the expenditures shown in the application as having heretofore been made for additions and betterments to the applicant's property and its leased lines, on capital expenditures for the acquisition, construction and extension of branch and spur lines, and to such extent upon the discharge and replacement of first lien and improvement 20-year mortgage bonds as may be necessary in order that the aggregate of all shall equal the par amount of stock to be issued, namely $20,000,000." In reality then the object of the issue is to reimburse in part the treasury of the carrier for past expenditures in additions and betterments and in acquisition and construction of lines, and to discharge and replace mortgage bonds; the total amount being in excess of $59,502,400, the amount of stock originally proposed to be issued in this case. In other words, the stockholders' money, as part of the surplus, was used for these purposes and this money is now to be replaced in part by the stock issue of only $30,000,000 and used for the purchase of Pere Marquette stock or for the other purposes above indicated.

Stockholders, as the equitable owners of the property of the company, have the right to insist that they receive a preference over strangers in the issuance of new stock. At common law, it was held that stock might be issued at par to the old stockholders although it was worth more than par in the market.

It has even been held that a stockholder has a right to subscribe for stock at par and cannot be restricted in this right by a vote of the majority stockholders, by requiring payment of a premium for such increased stock.

The question is peculiarly one involving managerial judgment and discretion. What is best for the road in promoting liberal investment in railroad stocks and encouraging the use of earnings for capital expenditures over a period of years, including bad times and good, is primarily within the field of management. Under the decision by Congress that there should not be government ownership, but should be instead private management under federal regulation, it is only reasonable and fair that private management be left free to function, except insofar as the public may be adversely affected. In the language of one of the cases above cited, "it is not for the public good that public utilities be unreasonably restrained of liberty of action." Moreover, as previously pointed out, there is, aside from the question of the reasonable and fair policy, the limitation imposed by the Constitution against invasion of the right of private management unless such right adversely affects or is reasonably calculated adversely to affect the public interest.

Prosperous Condition of the C. & O.

The issuance of stock at par instead of at a premium would not change the surplus at all. For every dollar of stock there would be a dollar put into the treasury of the railroad. In other words, the transaction would leave "the undivided profits untouched" and would add $30,000,000 "to the treasury of the corporation as capital." Nor would fixed charges be increased. The railroad has accumulated a large surplus amounting in the last year shown in the record, 1926,* to $89,155,850, or approximately $64 per share after issuance of the $20,000,000 of stock authorized in the report or approximately $60 per share after issuance of the 300,000 shares in accordance with the prayer of this petition. Capitalizable assets greatly exceed the proposed total capitalization. The report indicates that capitalizable assets

* Although not in the record, it seems proper to point out that since the record was closed the surplus of the C. & O. has been substantially increased amounting now to over $100,000,000. However, as pointed out in *Cook on Corporations* (8th Ed.) Sec. 546, "a public service commission can not compel the company to use its surplus for extensions instead of issuing new stock therefor."

are in "sufficient amount to support" even the stock increase proposed to be made of $59,502,400. The report also refers to the "prospect of increased earnings," "improvement in ratio of stock to funded debt" and the fact that the C. & O. is "on a sound dividend paying basis." The net income of the carrier is more than ample to meet any dividend payments on the new stock. The Company's securities stand well in the market. To hold that the public would be adversely affected by the issuance of stock at par would, it is respectfully submitted, be contrary to the evidence in the case, and would, under the decisions cited above, amount to arbitrary action condemned by the Constitution.

In the last four years shown in the record, the total net income of the C. & O. was $70,768,162 out of which only $24,653,023 was paid in dividends to the stockholders. Its surplus increased from $46,880,339 in 1922 to $89,155.850 in 1926; its capital stock in 1926 being $118,998,291 and its funded debt $193,172,223, including mortgage bonds, outstanding of $133,336,000, secured obligations to the United States of $17,273,023, and equipment trust obligations of $42,563,200. The stockholders are the equitable owners of the surplus, which has been built up from the net earnings. Part of the surplus which could have been used in paying dividends to them was used in additions and betterments, acquiring control of and constructing new lines, etc., and hence for such expenditures, in fact the very expenditures here in question, stock might have been issued to the stockholders free, *as a stock dividend* in accordance with principles followed in other cases. To deny the C. & O. authority to issue its stock at par to the stockholders and obtain $100 for each share would, under these circumstances, appear to be particularly unjust. Certainly if the sacrifice sustained by stockholders in building up a surplus entitles them to benefit through stock dividends, they should also be entitled to benefit through the issuance of stock at par.

A fundamental policy of far reaching importance in maintaining an adequate transportation system for the country, a purpose emphasized by the Transportation Act, and by the Supreme Court in construing it, is the encouragement of investors to put their money in railroad stocks. The difficulty of securing "additional investment of capital" after 1910 and before the Transportation Act of 1920, was pointed out by the Supreme Court in the Wisconsin Case. There can be no doubt that a corporation whose stock sells at a high premium and which offers new issues to stockholders at par is never at a loss to obtain new capital funds. A notable example of this is the American Telephone & Telegraph Company, which has followed the practice with great success in securing additional capital and in building up an efficient utility resting on a sound financial basis. Another example is the New York Central.

The Commission should encourage practices and methods tending to strengthen the railroads financially. It should invite stockholders to permit earnings to be invested freely with the assurance that if properly and wisely expended it will approve the issuance of stock therefor. It should continue to put its stamp of approval upon the practice of privileged subscriptions under which stock which could sell in the market at a premium is issued to stockholders at par. It should permit these stockholders to receive for each $100 of money paid into the treasury, $100 of stock to represent the stockholders' capital contribution.

In passing it is to be observed that the Commission has not been given authority to regulate cash dividends. The only restriction upon the payment of such dividends is that they shall not be made "from any funds properly included in capital account." Section 20a (12). Therefore, if the petitioner should, for example, pay a cash dividend of approximately $8.00 per share, the stockholders could use this money to purchase the premium stock at $150 (the ratio of stock being six to one) and the Commission would be without power to change this result. This merely serves to illustrate that after all the issuance of stock to the stockholders at par is a matter of private management as to which this Commission should not substitute its judgment for that of the directors and the stockholders.

Review by this Commission of its findings will, it is respectfully submitted, show that the evidence does not warrant the requirement that the stock should be issued at a premium instead of at par. The new issue of stock at par would not and could not adversely affect the credit of the carrier or impair or tend to impair its capacity to serve the public. Instead, its financial standing and credit would be strengthened by this just recognition of the sacrifices of the stockholders in foregoing dividends over a long period of years and by offering an inducement to them to remain constant and loyal to the company in the future. Upon the facts and under the law, to require the stock to be issued at a premium would, it is respectfully submitted, be an inexpedient and unwise policy, would be in excess of the statutory authority vested in the Commission, would unreasonably invade the private affairs of the company, would amount to usurpation of the legitimate functions of the board of directors and stockholders, and would unconstitutionally deprive the company of its right to manage its property.

Legislative History of the Act

The recommendations of this Commission to Congress may be searched in vain for any suggestion that the Commission should be authorized to do what it has done in this case, namely, to require stock to be issued at a premium. The underlying thought has been that over-capitalization should be prevented and that moneys obtained through the issuance of securities should be for legitimate carrier purposes. Nowhere in the hearings in Congress preceding the enactment of the Transportation Act and nowhere in the reports of Congress is there any mention or suggestion of a requirement that stock should be required to be issued at a premium. Nor is there any such proposal made. Since the rule in respect to the state regulation of railroads or other public utilities, except as to Massachusetts, was not to require stock to be issued at a premium, it appears unreasonable to read such an important change from the prevailing rule into the statute, in the absence of some compelling reason or language requiring this to be done, and there is no such reason or language.

Sale at Par Fairer to Small Stockholders

The sale of stock to stockholders at par is fair to the stockholder who does not care to increase his investment and who would not be able to participate in any of the benefits of the new issue if it were offered at a premium. Such stockholders receive their rights to subscribe which they can sell and in this way participate, although to a less extent than the stockholders who hold their stock, in the benefits of the new stock issue. In the present case for example the stockholder who is unable to pay $150 per share has stock rights worth slightly more than $4.00 per share, which would be the benefit he would receive, although for years the profits which might have been paid out in cash dividends on his stock were invested in the property of the carrier devoted to public service. If the stock were offered to such an investor at par he would be more apt to buy it or, if not, his stock rights would at least be worth much more to him than under the premium rule.

Although this case was hotly contested, there was no contention made by any party at the hearing, or at any other time, that the stock should be issued at a premium. The question on this point was raised by the Director of the Bureau of Finance, who presided at the hearing. In the absence of objection by any party and in view of the Commission's decisions in previous cases, the Petitioner did not seriously contemplate that the Commission would depart from its practice and require the stock to be issued at a premium and therefore hardly dealt with the matter further than to cite some of the previous decisions. It believes, however, that upon the further showing here made and the reconsideration of the facts in the case, it is only reasonable to expect that the Commission will modify its findings on this point and permit the stock to be issued at par, as originally prayed for.

There is nothing in the language or legislative history of the securities provisions of the act to show an intent by Congress to vest the Commission with authority to require stock of a railroad company to be issued at a premium to its stockholders. To make such a requirement, and thus declare to be illegal the issue of stock at par to the stockholders of the Chesapeake & Ohio, is to condemn a practice which has, since early days, been recognized by the courts as legitimate and proper, which has been customarily followed by well-managed and prosperous corporations, and which has been uniformly approved by this Commission.

To impose such a requirement is not necessary to prevent encroachment upon the rights of the public or to remedy anything adverse to the public interest. For every dollar of stock the stockholder pays a dollar of money into the treasury of the railroad, the capital of the company is correspondingly increased, and its surplus is undisturbed.

No fixed charges are imposed. The carrier's earnings and surplus fully protect its credit, and its securities stand well in the market.

The public is not only not adversely affected by issuance of the stock at par, but is benefited, because this method substantially promotes the flow of new capital into the railroad transportation systems of the country, deals fairly with small investors, and builds up a large body of loyal stockholders who can be depended upon in hard times and good. All of this contributes to well operated and efficient railroad service for the country—a prime object sought to be accomplished by Transportation Act, 1920.

Since Congress has definitely decided against government ownership of railroads, it is in the public interest that private initiative should be encouraged and that the right of private management should not be encroached upon unless adversely affecting the public interest, and this is clearly not the case here. That right is recognized by the Constitution. To require the issue of stock in this case at a premium would, it is respectfully submitted, be not only unwise and inexpedient as a matter of administrative policy and unjustly discriminatory against the Chesapeake & Ohio but would be in excess of the Commission's authority under the statute and in violation of the Constitution.

The Chesapeake & Ohio has also filed a reply to the petition filed by seven short line railroads for a reopening and reargument of the merger case, asking the commission to dismiss it on the ground that they had an opportunity at the hearing and did present evidence in support of their contention that the C. & O. should be required to include them in the proposed system.

Higher Mail Rates Prescribed

Commission allows increase of approximately 15 per cent retroactive for three years

WASHINGTON, D. C.

AN increase in the rates for the transportation of the mails by railroad, estimated at approximately $15,000,000 a year and retroactive for three years, is ordered by the Interstate Commerce Commission in a decision made public on July 30 in the railway mail pay case, which had been re-opened on applications filed by the railroads for a re-examination of the rates prescribed by the commission in 1919. The report follows closely the proposed report by Attorney-Examiner Mullen, recently made public, (*Railway Age*, June 16, 1928, page 1389) but the conclusions differ in some respects, and five commissioners, Lewis, Porter, McManamy, Taylor and Eastman, dissented in part from the majority report, while Commissioners Meyer and Farrell did not participate.

Upon re-examination the present rates of mail pay are found to be not fair and reasonable. Reasonable compensation from the dates applications were filed, or where not filed from July 24, 1925, the date of the order for re-examination, to August 1, 1928, the date when new scales of increased rates prescribed become effective, is fixed at 15 per cent in addition to the compensation paid or accrued at the established rates. For separately operated short lines not exceeding 100 miles in length, 80 per cent in addition to the compensation paid or accrued is fixed as reasonable.

Effective from August 1 the commission prescribes new scales of increased rates based on 39 cents for each mile of service for a 60-foot railway postoffice car, as compared with the old rate of 33.75 cents, and a rate of 47.25 cents proposed by the Committee on Railway Mail Pay, which had asked for increases approximating 40 per cent. For the New England lines the scale begins with a rate of 52.5 cents for each mile of service by a 60-foot r.p.o. car, and for separately operated railroads not exceeding 100 miles in length two scales are prescribed, one beginning at 73 cents for a 60-foot r.p.o. car for roads 50 to 100 miles, and one beginning at 91 cents for roads less than 50 miles.

Commissioners Lewis, Porter, McManamy and Taylor disagree with the retroactive feature of the order, and Commissioner McManamy says the record justifies no more than a 10 per cent increase. Commissioner Eastman said he was unwilling to rest a conclusion that the government should pay substantially more to the railroads for the carriage of the mails upon cost statistics of the character used in this case, but that he was not in accord with the commissioners who objected to the retroactive effect. He said he knew of no good reason why the carriers should be deprived of fair and reasonable compensation because the commission's ascertainment was delayed.

Carriers Sought 40 Per Cent. Increase

As a result of a cost study the carriers had contended that an increase of at least 40 per cent in mail revenue is necessary to pay the cost of service and return 5.75 per cent upon the investment, but after discussing various bases and cost studies, including those suggested by the Postoffice Department, the commission finds that an increase of 15 per cent for the carriers as a whole, except those separately considered, is justified after "giving consideration to all the figures based upon the respective cost studies; to the fact that none of these figures, except those in the carriers' exhibits, includes any charge against the passenger-train service for its proportion of the cost of handling non-revenue freight; giving special weight to the figures based on the plan for the division of train space followed in the original proceeding and subsequent re-examinations; and making an allowance for weaknesses of theories and methods."

Finds Increased Rates Reasonable

The report finds that the increased rates fixed for the Class I roads generally will be reasonable also for the Gulf, Mobile & Northern and the Birmingham & Northwestern, which had urged separate consideration. It also finds that the same percentage rate of increase should be applied to the rates of the New England carriers, saying that it will result in a greater increase in cents per mile due to the fact that rates for New England lines were increased 35 per cent over the rates for other lines in an earlier case. The 173 short

lines represented by the American Short Line Railroad Association requested that rates be prescribed for each carrier in accordance with the circumstances and conditions affecting it but the commission says the rates prescribed will, it is believed, produce results on the whole fair and reasonable both to the department and to the carriers.

Postoffice Department Proposed Territorial Grouping of Roads

The Postoffice Department had proposed during the hearings that all mail-carrying roads be grouped into five territorial groups but the report finds that the record does not furnish an adequate basis for determining group rates on a territorial basis even if such a change were considered desirable.

The general scale of rates established for the future, for carriers other than those accorded separate scales, is as follows:

For each mile of service by—	Rate Cents	For each mile of service by—	Rate Cents
60-foot r. p. o. car	39.00	15-foot storage space	13.00
30-foot apartment car	21.50	12-foot storage space	11.00
15-foot apartment car	14.50	9-foot storage space	8.75
70-foot storage car	47.00	6-foot storage space	6.25
60-foot storage car	40.50	3-foot storage space	3.50
30-foot storage space	21.50	15-foot closed-pouch space	14.50
27-foot storage space	20.00	12-foot closed-pouch space	12.50
24-foot storage space	18.50	9-foot closed-pouch space	10.25
21-foot storage space	16.75	6-foot closed-pouch space	7.50
18-foot storage space	15.00	3-foot closed-pouch space	4.50

Provided, That the minimum payment on any mail route, over any part of which mail is transported not less than six days a week shall be $72 per mile per annum.

The scale established for the New England roads is as follows:

For each mile of service by—	Rate Cents	For each mile of service by—	Rate Cents
60-foot r. p. o. car	52.50	15-foot storage space	17.75
30-foot apartment car	29.50	12-foot storage space	15.00
15-foot apartment car	19.50	9-foot storage space	12.00
70-foot storage car	63.00	6-foot storage space	8.25
60-foot storage car	54.00	3-foot storage space	4.50
30-foot storage space	29.50	15-foot closed-pouch space	19.50
27-foot storage space	27.25	12-foot closed-pouch space	17.00
24-foot storage space	25.00	9-foot closed-pouch space	14.00
21-foot storage space	22.75	6-foot closed-pouch space	10.00
18-foot storage space	20.25	3-foot closed-pouch space	6.00

Provided, That the minimum payment on any mail route, over any part of which mail is transported not less than six days a week, shall be $96.50 per mile per annum.

The rates for separately operated railroads, not exceeding 100 miles in length, are established as follows:

For each mile of service by—	(a) Separately operated railroads 50 to 100 miles in length Cents	(b) Separately operated railroads less than 50 miles in length Cents
50-foot r. p. o. car	73.00	91.00
30-foot apartment car	40.50	50.50
15-foot apartment car	27.00	34.00
70-foot storage car	88.00	110.50
60-foot storage car	75.50	94.50
30-foot storage space	40.50	50.50
27-foot storage space	37.75	47.00
24-foot storage space	35.00	43.50
21-foot storage space	31.75	39.50
18-foot storage space	28.25	35.25
15-foot storage space	24.50	30.75
12-foot storage space	20.75	26.00
9-foot storage space	16.50	20.50
6-foot storage space	11.75	14.75
3-foot storage space	7.00	8.50
15-foot closed-pouch space	27.00	34.00
12-foot closed-pouch space	23.00	28.75
9-foot closed-pouch space	18.25	23.00
6-foot closed-pouch space	13.25	16.75
3-foot closed-pouch space	8.00	10.00

Provided, That the minimum payment on any mail route, over any part of which mail is transported not less than six days a week shall be $112.50 per mile per annum.

It was also ordered that with respect to the carriers included in this proceeding upon reexamination, the provisions of the third paragraph of section 4, and the provisions of sections 5, 6, and 8 of the order entered December 23, 1919, as amended, be and they are hereby changed to read as follows:

4. In computing the miles of service of a storage car or lesser storage-space unit, the maximum space authorized in either direction of a round-trip car run shall be regarded as the space to be computed in both directions unless any part of the car containing such unit be used by the railroad company in the return movement.

5. All regular authorizations for full railway postal cars, apartment railway post-office cars, and full storage cars may be discontinued, in accordance with the needs of the service at established railway passenger or freight division points or junctions at which the train is scheduled to stop.

Regular authorizations of lesser closed-pouch and storage units shall not be changed en route at other than junction or division points, but they may begin at the point where closed-pouch or storage space becomes necessary and may be terminated at the point where the last mails are dispatched.

For the purpose of making changes in authorizations in lesser units of closed-pouch and storage space, a "junction" will be considered to be a point where two railroad lines of the same or of different companies cross or diverge, and at which mails are regularly received or dispatched by any train.

The same regular lesser unit of closed-pouch and storage space shall be authorized on every day of the week upon which closed-pouch and storage mails are carried in lesser units.

6. All units of emergency space needed to supplement regular authorizations shall be 3, 6, 9, 12, 15, 18, 21, 24, 27, or 30 feet without duplication or grouping, and such units may be discontinued, increased, or decreased at any point where a fluctuation in the volume in the mail carried requires a change from one unit to another.

8. Whenever a regular authorization of less than 30 feet is exceeded on more than 50 per cent of the trips in any calendar month the appropriate higher unit shall be authorized. Whenever a regular authorization of 30 feet of storage space is exceeded under like condition a full storage car of the appropriate length of 60 or 70 feet shall be authorized on the days of the week on which the 30-foot unit is exceeded on more than 50 per cent of the trips on such days. A regular authorization may be reduced to the appropriate smaller unit which would have accommodated the mails on more than 50 per cent of the trips in any calendar month. This rule will not apply to the month of December.

The provisions of the order entered on December 23, 1919, as amended, except as herein modified, remain in full force and effect.

* * *

On the Amesbury Branch, the B. & M.

Pennsylvania Country's Largest Buyer of Coal

*Uses 3.5 per cent. of bituminous output—Purchasing policies described**

By C. D. Young

General Purchasing Agent, Pennsylvania

THE following figures show the tonnage of bituminous coal produced in the United States; the tonnage produced yearly on the Pennsylvania and the per cent. of that tonnage to the total bituminous coal produced in the United States:

Year	Net Tons Produced on P. R. R.	Net Tons Produced in U. S.	Per Cent. P. R. R. to Total	Per Cent. to Total Based on 1919
1919	72,787,509	465,860,058	15.620	100.0
1920	75,186,380	568,666,683	13.222	84.6
1921	60,146,090	415,921,059	14.461	92.6
1922	53,847,500	422,268,099	12.751	81.6
1923	73,190,400	465,564,662	12.962	83.0
1924	58,485,800	483,686,538	12.089	77.4
1925	60,459,400	520,052,741	11.626	74.4
1926	66,358,750	578,290,000	11.473	73.5
1927	53,106,700	519,804,000	10.218	65.4

From these figures, it is seen that during 1919 the Pennsylvania hauled 15.6 per cent. of all the coal produced in the United States, and that this tonnage has fallen to 10 per cent. through the period from 1919 to 1927.

Despite this loss of one-third of its coal traffic, the Pennsylvania is the largest coal carrying road in the United States. The following figures show the number of tons of bituminous coal purchased, and the percentage of Pennsylvania purchases to the total production:

Year	Purchases (Net Tons)	Per Cent.	U. S. Production (Net Tons)
1921	16,227,735	3.9	415,921,950
1922	14,882,381	3.5	422,268,099
1923	21,745,485	3.9	564,564,662
1924	15,697,495	3.2	483,686,538
1925	17,232,815	3.3	520,052,741
1926	18,713,279	3.2	578,290,000
1927	17,032,893	3.3	519,804,000
Total	121,532,083		3,504,587,990
Average	17,361,726	3.5	500,655,427

The Pennsylvania is, presumably, the largest individual purchaser of bituminous coal in the United States.

Purchasing by the Pennsylvania is a continuous business and is an entirely different problem from spot buying or speculative buying against the markets. The articles required for the maintenance of the property and the service to the public must be purchased in continuous cycles; some commodities every week; a vast number of articles monthly; large volume business quarterly, and other commodities on a continuous or yearly contract basis.

Buy at Reasonable Price

It has been the fixed policy to buy at a reasonable market price, and at such a price as will insure delivery as required. It is also the fixed policy of the railroad to carry out its obligations, whether written or implied, and to execute contracts in accordance with the spirit of the agreement, although, as in all other business, such contracts may be adjusted from time to time to the mutual satisfaction of the contractual parties.

The policy of purchasing coal is the same as for all others. Bituminous coal is a product, a high percentage of the purchases of which it is necessary and desirable to confine to the line of the railroad from operators who may be able to give commercial business. The total purchases of off-line fuel have been as follows:

1924—1.1 per cent.
1925—1.3 per cent.
1926—1.4 per cent.
1927—1.1 per cent.

As the Pennsylvania is the largest coal-carrying road in the country, its problem in dealing with the coal operator is entirely dissimilar from that of other roads on the line of which the transportation of coal from the mines is only incidental, or on which there are no coal operations. Coal is generally purchased from operators in as close proximity to the point of consumption as is reasonably practicable; due consideration being given to reliability which insures continuous production; the length of haul; the quality of preparation and the varying characteristics of the fuels required for the different services.

In determining the region from which coal will be purchased, the market conditions are constantly followed in order to obtain the fuel as needed, and at a reasonable market price. Long experience in the study of the performance of coal in the different services has furnished an index of the approximate spread in price that should be paid for coal in one region, compared with the price of coal in another region. Certain of the railroad requirements can best be served by coal of a definite character, and such coal is sometimes obtainable in one region only, owing to the characteristic qualities of the coal. Broadly speaking, gas coals are used for heavy duty, high speed passenger service, low volatile coals for blacksmithing and power purposes in territories where excessive smoke is to be avoided, while the medium and high-volatile coals are used for freight service, branch line passenger service and in bunkers of marine equipment.

The coal is supplied for consumption in the 13 states and the District of Columbia, in which the Pennsylvania operates. In the states in which rail traffic is the densest, coal mining is one of the leading industries, and the coal is available for the railroad's needs without excessive haul.

Continuity Most Important

Through the agencies of coal publications, and other reliable sources, the market price of coal is currently available, together with the volume of coal moving and the probable market trends. These sources are studiously followed from week to week, more particularly for the assurance of the continuity of supply than for the price itself, and with proper regard for the distribution of coal orders among the numerous sellers. It can not be too strongly emphasized that the most important problem in this, as well as all other commodities, is the continuity of supply. It goes without saying that although you may buy at a cheap price, if the material

* From a recent statement made to the U. S. Senate Committee on Interstate Commerce, investigating the coal situation.

is not delivered in accordance with needs, immediate steps must be taken to replace the unfilled order, regardless of price, to sustain the operation of the railroad. The assurance of continuity of supply is one of the outstanding responsibilities of the buyer.

Coal Strikes Serious to Railroad

The continuous strife in the coal industry, with its recurring cessation of production and the Pennsylvania's enormous and unceasing requirements, have made the careful study of the industry's activities imperative. This was strikingly shown by the restricted production in 1922, when, after a strike in practically all fields served by the Pennsylvania, there was also a shopman's strike, which resulted in a shortage in rail transportation, amounting on some railroads to a complete stoppage. During the period of the combined strikes of the shopmen and miners a great burden was placed on the Pennsylvania in furnishing coal to the industries on its lines. This railroad continued its service when other coal carriers were badly crippled. This was accomplished only by going off-line for coal, hauling it from 350 to 650 miles to our lines and paying speculative prices, in addition to the off-line freight charges.

In the Fall of 1926, it was decided to store coal, to prevent the interruption in the continuity of the coal supply in 1927 that occurred in 1922. The coal reserve and storage for the critical periods since 1920 were:

Period	Maximum Storage of Coal Tons Stored	Day's Supply
1921-1922	1,440,000	37
1923-1924	2,184,000	49
1926-1927	2,593,000	65

In the Fall of 1926, it was the opinion that there was no need of storage because of the potential non-union production of coal on our lines, particularly in the regions which at that time were operating on part or full non-union basis. It was finally decided, however, to provide sufficient storage to assure an adequate supply of the proper kind of coal, and the largest storage of coal in the history of the railroad was provided, reaching a maximum of 65 days' supply by July, 1927.

Adhere to Honesty in Buying

The law requires the Pennsylvania to operate "under honest, efficient and economical management." As I understand this law, it does not permit the railroad or its agents to pay prices substantially in excess of the prevailing markets at the time of the purchase, nor would it be good business judgment to depreciate the price at which it purchased its articles to the detriment of the industries affected. I understand by "Honesty" under this law that the railroad must act justly and honorably in its business relations with its customers in all its transactions, and in relation to the property rights of others; that efficient railroad management requires the exercise of power to accomplish the desired end in order to produce the best business results and render the most effective service. By economical management I understand the railroad is charged with care and prudence and that it must not be wasteful or extravagant.

If I am correct in my understanding of the law, and my duties as an officer of the Pennsylvania, I wish to state that I have never, nor do I believe any one in my department has ever violated this law wilfully or knowingly. I further desire to state that I have never received any instructions, suggestions or intimations, directly or indirectly from any officer of the Pennsylvania that I should be guided in any way other than in accordance with my own judgment in all matters relating to the purchases for the Pennsylvania.

Repeal of Hoch-Smith Resolution Urged

REPEAL of the Hoch-Smith resolution is urged by the National Association of Owners of Railroad and Public Utility Securities in The Security Owner, a publication issued by the association. In the August issue it says:

"The Hoch-Smith resolution was enacted as a political gesture to the farmer in lieu of any constructive relief measure. Its effects were not adequately considered. The distribution of transportation costs in the refinement contemplated by the resolution is most difficult of accomplishment. The commission, however, can not evade its responsibility but must attempt compliance as nearly as possible. The proponents of the resolution would establish rates on agricultural products equal to or even less than the cost of the service. In order to recoup the losses of the carriers, the rates on other commodities must be established on a higher basis simply and solely due to the arbitrary mandate of the resolution. It seems to be in the interest of shippers that there should be a repeal of such an impracticable and unsound theory, lest rates throughout the country become subject to political pressure rather than economic necessity.

"Long before the Hoch-Smith Resolution was thought of, carriers operating in this territory were subjected to what some erroneously contend to be the true spirit of the resolution, viz., drastic reductions in revenue earned on products of agriculture without regard to the revenue needs of the carriers performing the service. Since 1920, general reductions approximating 21 per cent on coarse grain and 19 per cent on all grain and grain products have been ordered by the commission. These reductions have fallen with crushing force upon the northwestern carriers having a large proportion of their mileage in the territory where grain and grain products constitute a substantial part of their tonnage. These carriers have not only shared to the fullest extent in the general reductions in the territory, but also have been burdened with numerous special and additional reductions ordered by the commission. The effect of all such reductions on the rate structure is forcibly shown by the inadequate earnings of these carriers. Meanwhile, the farmers of the northwest have profited to the fullest measure by the reduced rates already ordered on agricultural products.

"The commission can not without ignoring its mandatory duty under section 15a substantially reduce a level of rates which does not now produce a fair return upon the aggregate value of carrier property in the Western District. It is incomprehensible that the complaining western interests, even though they have no responsibility under the act, should be indifferent to the consequences of a sweeping net reduction in that territory. It is a moderate statement to say that such action would seriously injure the northwestern roads which are hopeful that through the commission's sanction they will receive a generous and much needed increase in revenue by advances in the class rates in that territory."

Communications and Books

What Are the Greatest Heat Losses?

ELIZABETH, N. J.

TO THE EDITOR:

I read with interest the editorial entitled "Heat Radiation Losses," appearing in the June 9 issue of the *Railway Age.*

It is certainly true that any saving of heat which may be effected in locomotive operation is beneficial, provided that the cost of effecting the saving does not offset the benefits gained thereby. It is also true that a careful check of all locomotive heat radiation losses, with a view to developing ways of eliminating them insofar as practicable, would doubtless prove illuminating and beneficial, if due consideration were given the "insofar as practicable" part of the statement. In this case I am inclined to differ with you as to where and how most of the radiation losses occur, and I think perhaps you are inclined to attach relatively too much importance to these losses.

You lay particular stress on the loss of heat by radiation from cylinder heads, valve chambers and exposed steam passages. The most harmful effect which the loss of heat from these parts could have would be to cause condensation of part of the steam supplied to the cylinders, but condensation does not occur, because of the high degree of superheat attained in modern locomotive practice. In other words, the superheater supplies enough heat to the steam to prevent, not only condensation due to the expansion of steam in the cylinders, but condensation due to heat lost by radiation. Therefore, since most of the heat taken up by the superheater would otherwise go to waste out of the stack, the loss of heat by radiation from cylinders, valve chambers and steam pipes is relatively unimportant, provided this radiation is kept within reasonable limits by insulating them as far as practicable, as is done on modern locomotives.

It is extremely hard to calculate accurately the amount of heat lost by radiation from a locomotive boiler, but it is generally estimated to be about 3 per cent of the total heat in the coal fired, or only about 7 per cent of the total heat losses. The greater part of the heat lost by radiation is not lost from the cylinders, valve chambers and steam pipes, but from the boiler jacket and firebox. The heat lost per unit area is greater from the cylinders, valve chambers, etc., but the very much larger area of the boiler jacket and firebox is more than enough to make up for this, in spite of better insulation.

In order to make any substantial reduction in the heat lost by radiation, it would mean a much more elaborate and expensive system of boiler lagging than is used at present, the cost of which would probably be out of all proportion to the benefits gained. The money might better be applied to reduce some of the greater and more important heat losses, such as heat lost in the smokebox gases and exhaust steam, and in fuel escaping unburned.

N. M. TRAPNELL.

A Study of Firebox Volume

SCHENECTADY, N. Y.

TO THE EDITOR:

While I did not attend the recent Atlantic City convention, I read with interest your comments on page 1490D2 of the Daily issue of June 23, fifth paragraph, where you mention that little is known about the relation between firebox volume and grate area.

One thing has been done affecting this matter by the United States Bureau of Mines. An experimental furnace equipped with suitable apparatus for taking temperature and gas samples during the passage of the hot gases toward the outlet, and which continues further from the grate than any ordinary commercial design of furnace, was used for tests of the completeness of combustion at various points in the path of the gases.

As I recollect it, the combustible elements are reduced but slowly after the point where the total volume above the grate reaches the ratio of eight times the area of the grate. Even at volumes somewhat less, the remaining combustible is not large and its loss is less than results from variations in the manner of firing. But the important thing is the fact that combustion is quite complete, practically speaking, when these ratios have been reached. The experiments were made by Henry Kreisinger and others, and the bulletin was published about ten years ago.

Going over the volumes of a considerable number of typical locomotives from the time when fireboxes were dropped between the frames thirty-five or forty years ago and following down the practices of recent days, I find that the volume ratio has progressed from six to eight times the grate area, and that it appears to be practicable to establish an empirical rule for the length of combustion chamber—if one is necessary to produce the desired volume—and an accompanying tube length which will appear more consistent than one will observe in certain comparisons made by random selections, such for instance, as 6-ft. combustion chamber with 18-ft. tubes and a 4-ft. chamber with 21-ft. tubes. The general trend of the proportions of the locomotive boiler is toward the proportions determined by the Bureau of Mines, so their application will not be entirely new in theory but merely a rationalizing of practice.

This element of design is one which has held my interest for some years and I have not seen any results of technical study equal to those referred to on which to build firebox proportions.

I write this mainly to point out that firebox volume has not been forgotten altogether, even if it has not become a standardized element in proportioning locomotive boilers.

FRANK SCOVILLE.

New Books

Two Essays in Early Locomotive History By C. F. Dendy Marshall, M.A., M.I. Loco. E. 120 pages, illustrated, 8½ in. by 11 in. Price 12 s. 6 p. Published by the Locomotive Publishing Company, Ltd., 3 Amen Corner, London, E. C. 4, England.

The subjects of the two essays by Mr. Marshall contained in this book are: The First Hundred Railway Engines; and British Locomotives in North America. Mr. Marshall, who is the author of several other books on railroad subjects, the most notable of which is, The Resistance of Express Trains, has made a sincere attempt to present the history of the early locomotive in connected form. He has gone to considerable pains to ascertain the true facts in connection with the first hundred railway locomotives and has used first-hand references as far as possible. Although the book is of primary interest to British readers, many American railway men will find much of interest in its pages.

RAILWAY YEAR BOOK, 1928. *384 pages. 5¼ in. by 8½ in. Published by the Railway Publishing Company, Ltd., 33, Tothill street, London. Price $1.25.*

The thirty-first annual edition of the Railway Year Book provides detailed information regarding the physical properties, the corporate structures and lists of officers of railways in Great Britian, Ireland, India, Asia (outside of India), Africa, Australia, Canada, South America and Central America with particular attention paid to the British owned companies. In the case of the railways in Great Britan and Ireland the information is especially complete with black and white maps for each company. For other countries one map is provided for all railways in that country. The volume contains information

concerning the latest developments in regard to train services, long non-stop runs, high-speed schedules, restaurant and sleeping car and slip-coach facilities, electrification and steamships and a directory of railway societies and institutions and parliamentary acts affecting railways.

Thirteenth Annual Report of the Engineering Foundation. Thirty-six pages illustrated, 7 in. by 10 in. Published by the Engineering Foundation, Engineering Societies building, 29 West Thirty-Ninth street, New York.

This is the annual report for the thirteenth year of activity of the Engineering Foundation which functions under the joint auspices of the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers and the American Institute of Electrical Engineers. It contains a resume of the origin and function of the Engineering Foundation, a review of the year's activities, a list of the members of the Foundation, a brief outline of the various projects which the Foundation is sponsoring and a list of the fifteen publications that have been published during the past thirteen years.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Studies in Securities 1928—Second Issue. Includes brief financial histories of 20 large railroads. Helpful for use with maps and colored pins in presenting American commercial activity. 101 p. Pub. by Jas. H. Oliphant & Co., New York, *Apply.*

Recommended Methods Covering the Loading of Various Commodities in Closed Cars, Box, Stock, Etc. A manual, with diagrams, of rules for bracing, blocking, securing door protection and decking of material shipped in closed cars. 1928 issue. 14 p. Pub. by American Railway Association, New York and Chicago.

Report of the Delegates of the United States of America to the Sixth International Conference of American States Held at Havana, Cuba, January 16 to February 20, 1928. Messrs. Oscar W. Underwood and Henry P. Fletcher represented the United States on the Committee on Communications which considered among other things "International regulation of railway traffic" p. 36 and Appendix 45, p. 280; and "Report of the Pan-American railway committee" p. 36 and Appendix 44, p. 278-299. Appendix 34, "Longitudinal highway," Appendix 49 "Standardization of specifications, and Appendix 55 regarding commission to prepare bases of an inter-American convention on maritime, fluvial, land, and aerial communications, may also be of interest. 343 p. Pub. by U. S. Govt. Print. Off., Washington, D. C., 50 cents.

Periodical Articles

High Water, by A. W. Somerville. An incident of flood-time railroading in short story form, bringing out three persons' ideas of valuables. Saturday Evening Post, July 14, 1928, p. 12-13, 90, 95, 98.

Colombian Economic Status Affected by Transport Delays, By Charles J. Dean. A drought in 1926 seriously affected the Magdalena river, Colombia's main artery of commerce, and shipments now are from 3 months to a year overdue. Illustrated. Commerce Reports, July 23, 1928, p. 202-203.

Railway Electrification in Europe. Maps and illustrations. No. 1—Italian State Railways, Modern Transport, June 23, 1928, p. 3-5 and June 30, 1928, p. 10, 21. No. 2—Paris-Orleans Railway System, Modern Transport, July 14, 1928, p. 3-5.

The Relation of Railroads to Floods and Flood Control, by C. R. Knowles. What flood-time railroading means and costs as exemplified by Mississippi flood of 1927, and effect on railroads of various flood control plans. Journal of the Western Society of Engineers, June, 1928, p. 307-311. (Reprinted as Appendix G, p. 224-228, of House Report No. 1072, 70th Congress, 1st sess., entitled "Flood Control in the Mississippi Valley" and including Flood control plans proposed. Pub. by U. S. Govt. Print. Off., Washington, D. C., 45 cents.)

Looking Backward

Fifty Years Ago

The first train on the Worthington & Sioux Falls [now part of the Chicago, St. Paul, Minneapolis & Omaha] went through on August 1, affording the first through route between St. Paul, Minn., and Sioux Falls, S. D.—*Chicago Railway Review,* August 3, 1878.

A discharged engineman of the Pittsburgh, Fort Wayne & Chicago [now part of the Pennsylvania] has succeeded in partially gratifying his revenge by causing some 30 enginemen and firemen to be arrested and fined for violating the hitherto obsolete law of Pennsylvania, passed in 1794, against Sunday labor. Last Sunday the railroad suspended its freight trains at Pittsburgh while counsel examines the validity of the law.—*Railway Age,* August 1, 1878.

Twenty-Five Years Ago

The Northern Securities Company has been acquitted by the United States Circuit Court at St. Paul, of the charge of existing in violation of the Minnesota Anti-Trust law and of the state law forbidding the consolidation of parallel and competing railroad lines. This decision is contrary to the finding of the United States Circuit Court of Appeals at St. Louis in April and the conflicting decisions are now before the Supreme Court for final adjudication.—*Railway Age,* August 7, 1903.

Because of the continued depression in the stock market the New York firm of brokers which has been for about a year and a half in control of the Evansville & Terre Haute [now part of the Chicago & Eastern Illinois] failed two weeks ago, and the Chicago & Eastern Illinois has been able to buy the former road on favorable terms. The C. & E. I. now owns a majority of the capital stock of the E. & T. H. and is provided with its own connection with the Louisville & Nashville at Evansville, Ind.—*Railway Age,* August 7, 1903.

After months of public hearings, private debate and newspaper discussions, the Canadian government, through the prime minister, on July 30, announced to parliament that an agreement had been reached for the construction of a "national transcontinental railway," to be known as the Grand Trunk Pacific. The bill proposes to authorize construction of a new line of railway from Moncton, N. B., to Quebec, Que., thence westerly through the Northwest territories and British Columbia to the Pacific Ocean, about 3,300 miles.—*Railway Age,* August 7, 1903.

Ten Years Ago

The cost of running a train 100 miles on the Erie increased in 1917 to a rather astonishing extent. The total mileage of all trains run in 1917 was 5.71 per cent less than in 1916, although the ton mileage was 7.36 per cent greater and the passenger mileage was 3.17 per cent greater. But at the same time total transportation expenses, including fuel, increased more than 31 per cent. The cost of fuel for train locomotives alone increased 73 per cent over 1916.—*Railway Age,* August 2, 1918.

The costliness of munitions explosions is well illustrated by the Black Tom Island disaster of July, 1916. The British government filed a suit in the New Jersey supreme court on July 30, asking $1,022,000 damages from the Lehigh Valley in connection with the destruction of British-owned munitions in the Black Tom disaster. The French republic has entered claims for $520,000. With other damages the aggregate cost of the explosion will be nearly $2,000,000.—*Railway Review,* August 3, 1918..

Odds and Ends of Railroading

Railway men sometimes have unusual sidelines. As an example, there is Conductor "Bub" Griffin, of the Georgia & Florida. In addition to punching tickets, Griffin owns and manages a swimming pool at Douglas, Ga.

It's a Boy!

Traffic on the Chicago & North Western was held up on July 18, when the Hagenbeck Wallace circus train blocked the main line at Francis Creek, Wis., while "Alice," six ton hippopotamus, was presenting to the world a hippo baby. The baby weighed 100 pounds and it's a boy. The Menominee Boiler Works, on three hours notice, built a special "crib" or tank for the infant, eight feet long by four feet high.

Another Theory Upset

The ordinary supposition that, because the Missouri Pacific rail motor car operating between Topeka, Kan., and Pittsburgh is painted dark green and not bright red, it is rendered immune to attack by bulls that wander onto the right-of-way was unexpectedly proven false on July 21, according to a newspaper report from Ft. Scott. An angry bull, apparently incensed by the headlight, attacked the car near Mapleton, derailed it and died from injuries received in the encounter.

Thought for Summer Tourists

The average automobile weighs, say 2,000 lb., without a load. Such an automobile, even when loaded with four or five people weighs less than 3,000 lb. Suppose this 2,800 lb. load tries a tilt at a railway crossing with a freight engine weighing close to 400,000 lb. Is there any doubt in your mind as to which would be victorious? Yet, daily, some where in the United States, car drivers try to beat the engine to a crossing, and busy newspaper men are forced to write heart-rending stories of the manner in which the passengers in the automobile were either killed or injured.

An Off-Line Birthday Party

An event unique in the annals of railroading was celebrated on July 2 when the Pennsylvania commemorated the sixtieth anniversary of the opening of its off-line freight office at Des Moines, Iowa. Not only was the Des Moines agency one of the first freight offices to be established by an American railroad off its own lines, but its anniversary is given added significance by the fact that in all the years it has served Des Moines only two agents have been in charge of its affairs. The first agent was Earl P. Douglas, who served from July 1, 1868, when the office was opened, until June, 1905, a total of 37 years. E. M. Wentworth, the present agent, succeeded Mr. Douglas and has served continuously since his appointment 23 years ago.

Coincidental Careers

In May, 1884, two boys were born in English villages only a few miles apart. In 1901, within a few days of each other, these two boys entered railway service, one in England, the other in the United States. In 1906, one was promoted to draftsman for the Canadian Pacific, the other to secretary to the vice-president of the Illinois Central. In 1917, the one was appointed chief draftsman, motive power department, the other became assistant general freight agent. In January, 1920, the C. P. man was appointed works manager at Winnipeg, while in March of the same year the I. C. man became assistant to the traffic manager. Following their usual practice of having parallel careers, one was appointed assistant superintendent of motive power on July 1, the other assistant freight traffic manager on July 16, sketches of their careers appearing on following pages in the *Railway Age* of July 21. Henry B. Bowen is the Canadian Pacific officer referred to, while the other is William Haywood of the Illinois Central.

A Modern Fairy Tale

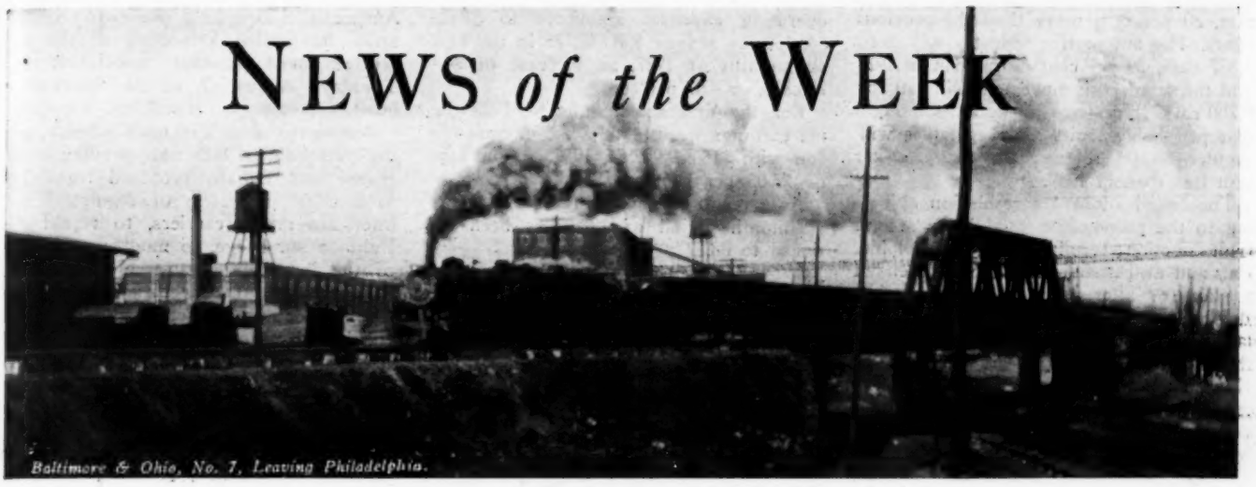
Sometimes, in reading newspaper accounts of accidents, one can hardly blame the old-time railway officer for his abhorrence of reporters. On the other hand, the reporter has some arguments on his side as well. To the reporter who has never before seen a railway accident, the derailment of one or two freight cars seems a major casualty, particularly if he arrives on the scene at night. Accordingly, he writes a lurid account that is probably exaggerated. The following account of a mishap is a case in point. It appeared in a Cleveland paper last week: "While two broken driving rods were tearing up the roadbed, a fireman of a Baltimore & Ohio locomotive climbed to the top of the engine and released the exhaust valves to prevent an explosion, should the locomotive leave the rails. The express was traveling more than 40 miles an hour when the rods snapped. Engineer Mark S. Goodright applied airbrakes, but they did not function. Arthur Bien, the fireman, then climbed to the top of the locomotive and clung there amid clouds of white steam while he emptied the boilers through the valves. Half a mile from where the rods broke the train stopped."

Locomotive Model Collection

C. A. Lehman, a teacher in Long Beach, Cal., has one of the most complete collections of locomotive models in the country, all of which he built in his spare time. The accompanying illustration shows Lehman and his models, which cover locomotive building from 1828 to the present. Starting in the lower

right hand corner and reading up, they are: "Tom Thumb," of 1828; "DeWitt Clinton," 1831; "Pioneer," 1848, first engine used by the Chicago & North Western; typical locomotive of 1850; "Falcon," 1869, Central Pacific engine, which met Union Pacific 119 at Promontory, Utah; fast passenger locomotive, 1880; passenger type, 1895; Atlantic type, 1905; heavy Pacific type, 1910; compound Mallet, 1918; and the three-cylinder Union Pacific engine of the present.

NEWS *of the* WEEK



Baltimore & Ohio, No. 7, Leaving Philadelphia.

JAMES R. CLARK of Bloomington, Ill., has been appointed as a member of the Illinois Commerce Commission. Mr. Clark has served with the commission as assistant commissioner.

THE INTERSTATE COMMERCE COMMISSION has extended the time for the filing of exceptions to the proposed report by Commissioner Frank McManamy relating to the use of private cars from 60 to 90 days from the date of service of the report.

FRED N. OLIVER, who has been in the service of the Interstate Commerce Commission as attorney for the past seven years, has been appointed general solicitor of the National Association of Owners of Railroad and Public Utility Securities, with office at Washington, D. C. At the time of his resignation he was senior attorney, valuation.

Wage Statistics for April

The total number of employees reported to the Interstate Commerce Commission by Class 1 railways for the month of April was 1,658,708, a decrease of 99,763, or 5.67 per cent, as compared with the number reported for the corresponding month last year. The total compensation was $229,960,746, a decrease of $13,691,717, or 5.62 per cent.

Accident on Long Island

The first coach of an electric train of the Long Island, outbound from Flatbush, Brooklyn, N. Y., plunged through an open drawbridge into Jamaica Bay on July 21. No one was seriously injured in the accident although 18 persons required brief hospital treatment. The second car stopped on the edge of the open draw while it remained coupled to the coach which had entered the bay. The draw had been opened to permit the passage of a tug and the accident was due to the failure of the train motor man to heed the signal set against the approach of his train.

The C. P. R. in June

Net operating revenue of the Canadian tofore expended to repair flood damage.

showed an increase of $612,731 over the same month last year, the total for June this year being $2,877,184, as compared with $2,264,452 in June last year. For the month under review, gross earnings amounted to $17,500,938, an increase of $2,230,034 over June last year, while by the same comparison, operating expenses increased by $1,617,302.

For the first six months of this year, the railroad shows net earnings of $16,451,737, as against $13,012,299 in the corresponding six months of 1927, being an increase of $3,439,437. By this same comparison, gross earnings are shown higher by $8,863,238 while operating expenses increased by $5,423,800.

Northern Pacific Land Sales Increase

During the first six months of 1928 the Northern Pacific sold more than twice the amount of land disposed of in the corresponding period of 1927, with an aggregate sale price four times as great. One of the characteristics of these sales is the active demand for virgin farm lands. In the Redwater district of eastern Montana, a territory opened to transportation by a new branch line of the Northern Pacific, in the first six months of 1927, 1,458 acres were sold for $26,652. In the same period of 1928 the sales totaled 38,848 acres at an aggregate sale price of $490,712. These sales were made in parcels ranging from a quarter section to a section in area.

A. R. E. A. Selects World Engineering Congress Committee

The American Railway Engineering Association has accepted an invitation to be represented at the world engineering congress in Japan in October, 1929 and W. D. Faucette, president, has appointed the following men as a committee from the association to co-operate with the American committee in working out the details of its representation: D. J. Brumley, chairman, chief engineer, Chicago Terminal Improvements, I. C., Chicago; G. J. Ray, vice-chairman, chief engineer, D. L. & W., Hoboken, N. J.; J. M. R. Fairbairn, chief engineer, C. P. R., Montreal, Que.; Earl Stimson, chief engineer maintenance, B. & O., Baltimore, Md.; W. C. Cushing, engineer of standards, Penna., Philadelphia, Pa. In addition, E. H. Fritch, secretary of the association and President Faucette are ex-officio members.

P. & W. V. Opposes Reconsideration of Extension Case

The Pittsburgh & West Virginia, in a reply to the petitions filed with the Interstate Commerce Commission by the Baltimore & Ohio, the New York, Chicago & St. Louis and the Pennsylvania, which ask for a reargument and reconsideration of the decision by which the commission authorized it to build an extension from Cochran's Mill to Connellsville, Pa., takes the position that the commission may not recall the certificate issued because it has already started work on the extension. It states that, acting under the commission's certificate and order, dated June 12 and published June 21, it started work on the extension and certified to the commission that it had done so on June 28, whereas it understands that no petition for a rehearing was filed until July 3. Therefore, it says, it would be to no purpose to grant a re-argument, and it asks that the petitions be dismissed. If, however, the commission does not agree with this contention, request is made that a hearing be had on the question of the propriety and power of the commission to vacate the certificate and order in question.

Pacific Coast Board

Car loadings in California, Nevada, Arizona and western New Mexico in the third quarter of 1928 will be about 3.7 per cent greater than in the third quarter of 1927, according to an estimate made at a meeting of the Pacific Coast Advisory Board at Fresno, Cal., on June 15. The total loadings are expected to require 426,114 cars as opposed to 411,081 cars in 1927. The petroleum movement will necessitate the use of 55,000

cars, 30 per cent more than the previous years. The automotive industry will need 4,357 cars, 29 per cent more than in 1927 and the dried fruit movement will call for 6,700 cars, 18 per cent more. It is thought that perishable fruits and vegetables will require 98,100 refrigerator cars 2.2 per cent less than in 1927.

The board adopted a resolution objecting to the proposal to establish a second fruit auction terminal at Philadelphia, Pa., and at Pittsburgh and recommended a plan for alternating sales every other day between the two terminals in the latter city. The resolution pointed out the inadequacy of present facilities at New York and suggested that any extension of facilities at tnat point should contemplate the use of all such facilities by all roads. Fruit auction plants at Chicago, Cleveland, St. Louis, Boston, Cincinnati and the proposed facilities at Detroit were declared to meet fully the requirements for that type of traffic.

Panama Canal Traffic Sets New Records

The total number of commercial transits of the Panama Canal for the fiscal year ending June 30, 1928, aggregated 6,456, and the total tolls collection $26,944,499.77. This established new high records for total transits and tolls collected for any calendar or fiscal year period, exceeding by 371 transits and $713,476.83 in tolls the previous high record established in the calendar year 1927, according to the Panama Canal Record.

The daily average number of commercial transits during the year was 17.63, as compared with 15 for the fiscal year 1927. The daily average tolls collection amounted to $73,618.85 as compared with $66,380.36 for the previous fiscal year. The average amount of tolls paid by each of the commercial transits was $4,173.56, as compared with $4,425.35 for the fiscal year 1927.

Traffic in the last six months was somewhat lower than that in the first six months. This was caused by a sharp decline in mineral oil traffic beginning in January. The loss in mineral oil traffic was partly offset, however, by heavy movement of Canadian grain routed through the canal to Europe.

The C. N. R. in June

Canadian National earnings for the month of June showed substantial increases both in gross and net. During the month of June, the gross earnings of the National System totaled $22,032,767, as against $20,097,590, an increase of $1,935,176, equivalent to 9.63 per cent.

In the month of June net earnings were $2,806,658, and in June, 1927, net earnings were $1,534,285, an increase in favor of June, 1928, of $1,272,372, equivalent to 82.93 per cent.

For the six months, January to June, inclusive, gross earnings amounted to $123,213,526, which compares with $114,437,683 during the similar six-month period of 1927, an increase of 7.67 per cent, or $8,775,842.

In that six-month period of 1928, operating expenses amounted to $103,343,150, as against $98,547,775 in the first six months of 1927, an increase of $4,795,375, or 4.87 per cent.

For the first six months of 1928 the net earnings were $19,870,375, in comparison with $15,889,907 in 1927, an increase of 25.05 per cent, or $3,980,467.

As a result the operating ratio for the six-month period of 1928 has been reduced to 83.87 per cent.

Longview, Wash., Celebrates New Through Train Service

The city of Longview, Wash., celebrated the inauguration of through service from and to Portland, Ore., and Seattle, Wash., on July 14 when several thousand persons gathered at the Longview, Portland & Northern station for the arrival of the first train. Pooled service between Portland and Seattle has been established by the Great Northern, the Northern Pacific and the Union Pacific with two of the five trains in each direction now operated via Longview over

Commissioner Meyer Congratulating R. A. Long, Chairman of the Long Bell Lumber Company, on the Arrival of the First Through Train at Longview

the L. P. & N. and the other three moving via Kelso, Wash. Longview and Kelso are about a mile and a half apart.

B. H. Meyer, a member of the Interstate Commerce Commission, purchased the first ticket from Longview for the new service and was the first passenger to board the first train. Mr. Meyer addressed the crowd at the station. The surrounding territory sent representatives to Longview—girls who came as "Miss Ilwaco," "Miss Castle Rock," "Miss Chinook" and from other cities.

Short Lines to Consider Proposed Legislation

Bird M. Robinson, president of the American Short Line Railroad Association, has called a meeting of the executive board of that association for Tuesday, August 7, at the Blackstone hotel, Chicago.

Among matters for consideration are the consolidation bills now pending in the House and Senate, proposed legislation to establish a system of regulation for interstate motor carriers, to repeal the Pullman surcharge, to modify provisions of the interstate commerce act relating to certificates of convenience and necessity, to enlarge governmental facilities for inland waterway transportation, and that sought by short lines to exempt them from the operation of the recapture clause of Section 15a. This last is regarded as most important, because many lines enjoy prosperity for one or two years by reason of road construction or some similar temporary activity. During those periods a portion of their profits must be contributed to the recapture fund, and later on when busses and trucks take over their traffic the losses must be borne alone.

The purpose of the meeting is to map out a program for the coming session of Congress. Later on in the Fall it is planned to have a number of regional meetings of members of the association so that the entire membership may help to carry forward the program adopted at the Chicago meeting.

Railway Business Women Meet

About 40 women engaged in various branches of railroad work attended the transportation vocational session of the National Federation of Business and Professional Women's Clubs at New Orleans, La., on July 9, representing 15 railroads in New York Maryland, Ohio, Illinois, Minnesota, Nebraska, Tennessee, Kentucky, Virginia, Florida and Louisiana. Mrs. William Gary Brown, of the tourist bureau of the Baltimore & Ohio at Chicago, opened the meeting as national transportation chairman for the federation, turning over the chairmanship of the meeting to Margaret Talbot Stevens, associate editor of the Baltimore & Ohio Magazine.

The entire program was devoted to the subject of "Opportunities for Women In Transportation," divided into subtopics for discussion, such as railway publications and publicity departments, ticket selling and passenger solicitation, private secretaryships and chief clerkships and public relations. Papers were presented on the following subjects: "Editing the Railway House Organ," Donna J. Harkness, publicity department, Cleveland, Cincinnati, Chicago & St. Louis; "Opportunities as a Chief Clerk," Olivia R. Clark, chief clerk to trainmaster, Louisville & Nashville; "Opportunities as a Private Secretary," Mrs. Betty Crooks, secretary to assistant general passenger agent; Atlantic Coast Line; "Carrying the Transportation Message to Mrs. Garcia," Myrtle Miles, supervisor women's branch, agricultural department, New York Central; "The Woman Ticket Agent," Helen Roddy, ticket agent, Mis-

souri Pacific; "The Woman Ticket Seller," Bessie C. Abell, ticket seller, Louisville & Nashville.

Kansas Commission Refuses to Set Aside Long Train Order

The Public Service Commission of Kansas on July 23 denied the motion of the Brotherhood of Railroad Trainmen and the Brotherhood of Locomotive Firemen and Enginemen to set aside the commission's findings on which its order of May 28, 1927, in the long train case was based.

That order directed the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Missouri-Kansas-Texas, the Missouri Pacific, the St. Louis-San Francisco and the Union Pacific to set up new rules for the giving of manual signals in order to make them susceptible of free observance on long trains. It also directed the railroads mentioned to bring the air brake systems in use on their freight trains to the highest possible standard of efficiency and to initiate periodical improvements and betterments in the air brake systems which would keep pace with the operation of longer trains. The original complaint was entered by the brotherhoods, who also asked the commission to limit the length of freight trains until the railroads should provide a signal system and brakes adequate to control longer trains. This the commission refused to do.

The Kansas supreme court recently characterized the original order of the commission as "indefinite" and indicated that to be truly enforceable it should be more specific. The commission holds that the evidence presented in 1927 would not justify a more specific order. Representatives of the trainmen have indicated an intention to present the matter to the Interstate Commerce Commission.

Central Western Board Organizes Agricultural Council

The Central Western Shippers Advisory Board, which has jurisdiction over Colorado, Wyoming, Utah, Nebraska and Southern Idaho, formed, at its meeting on June 27, an agricultural council which will study plans and programs for production, marketing and distribution of agricultural products.

The reasons stated by H. G. Taylor, manager of public relations of the car service division of the American Railway Association, for the formation of the council were:

An apparent popular demand for agriculturalists, business executives and transportation agencies to correlate their efforts toward developing a practical study of problems of agricultural distribution, marketing and their relationship to a program of production. Through these agencies, it is planned to gather facts concerning the problems of agriculture and disseminate them to the agriculturalist in an effort to assist him to attain more nearly a balance between production and consumption. It is intended to point out to organized business, on one hand and unorganized agriculture, on the other—their inter-dependence and common problems in an effort to enlist the business executives guidance in assisting agriculture to a solution of the foregoing.

The council will correlate the energies of the several agricultural commodity committees of the advisory board and will analyze and consider plans and proposals that may be submitted to it.

R. E. Sheperd of Jerome, Idaho, chairman of the Federal Farm Loan Bank of Spokane, Wash., and chairman of the council at the organization meeting, expressed the belief that the problems of the agricultural industry will be best solved by such agencies as this agricultural council rather than through Congressional farm relief measures.

This council is similar in purpose to the first agricultural council which was formed by the Pacific Northwest Advisory Board early in 1927.

Railway Purchases in 1927

Railway purchases in the United States in 1927 totaled $2,168,000,000, an amount equivalent to $78.60 for each family in this country, according to a statement by L. A. Downs, president of the Illinois Central. The expenditure for current purchases—material and supplies—was $1,396,000,000 while $772,000,000 was spent for new equipment and additions and betterments to fixed property.

The railroads spent $439,000,000 in 1927 for coal alone, the statement continues. Every fourth dollar earned by the coal miners last year came from the railroads. The railroads spent $433,000,000 for iron and steel products. Employees of the iron and steel industry derived approximately one-fifth of their income from that source. Railway purchases of lumber, ties, poles and other forest products in 1927 amounted to $176,000,000. One-fourth of all the wages paid in the lumber industry came from the railroads.

One hundred fifty-nine plants, employing more than 62,000 wage earners, are engaged in building locomotives and cars for railway use, in addition to the many other plants engaged in the manufacture of railway supplies. These plants in turn are also extensive purchasers of other products, such as coal, iron and lumber, thereby distributing widely the money the railroads pay them.

Added to these major items are many other products used by the railroads, including nearly every conceivable type of material and supplies. When the railroads suffer a decline in earnings they must necessarily curtail their purchases, buying only such items and such quantities as are imperatively needed to keep their plants in operation. Their restricted buying is immediately reflected in curtailed activity in other industries. On the other hand, prospering railroads are able to renew their facilities, replace old equipment and undertake needed improvements, all of which creates demands for the products of other industries and has a beneficial effect upon business generally.

Traffic

The New Jersey Board of Public Utility Commissioners has authorized the West Jersey & Seashore, a subsidiary of the Pennsylvania, to close its agencies at Mickleton, Aura and Buena—this permission following that granted a few weeks ago for closing several other agencies. Permission to abolish agencies at two other points was refused.

The Interstate Commerce Commission has refused to permit the Boston & Maine to cancel its tariffs via Mystic Wharf, Boston, Mass., where freight is interchanged with the Merchants & Miners Transportation Co., thence to be transferred by lighter to the piers of the steamship line. The road proposed that the steamship company substitute trucks for the lighters and accept delivery at the freight house instead of Mystic Wharf. The Commission granted this option to the Boston & Maine, provided the freight be trucked over the alternative route at the expense of the railroad.

The Wisconsin Railroad Commission, in granting the Chicago & North Western permission to discontinue its station agent at Odanah, Wis., called attention to the fact that the receipts had decreased from $10,311 in 1925 to $9,041 in 1926 and $6,504 in 1927. In granting permission to the Minneapolis, St. Paul & Sault Ste. Marie to discontinue agency service at Deronda, Wis., it was shown that of the total receipts of $2,335 in 1927, $1,786 were used to pay the agent's salary.

The Southern Pacific on July 15, through its motor transport subsidiary, opened motor coach service between Grants Pass, Ore., and Eureka, Cal., 186 miles in connection with train service on that railroad and the Northwestern Pacific, providing travelers with access to the redwood forests in that section. Between Portland, Ore., and San Francisco, Cal., it is now possible to use Southern Pacific train service from Portland to Grants Pass, motor coach service from Grants Pass to Eureka and Northwestern Pacific train service from Eureka to San Francisco.

On July 25 the Southern Pacific inaugurated the first of a series of 10-day round trip coach excursions from San Francisco, Cal., Los Angeles, Colton, San Bernardino, Oroville, Roseville and intermediate stations to Salt Lake City, Utah, and Ogden at a rate of $20. The coaches left on the eastbound trip on July 25 and August 1 and similar excursions westbound from Salt Lake City and Ogden were scheduled to leave on July 28 and August 4. The excursion tickets were honored for coach travel only and were good for stopovers in California, with a maximum possible trip of nearly 2,600 miles.

Grape Rates Reduced Under Hoch-Smith Resolution

The classification rating and rates on fresh grapes in carloads, from Chautauqua, Erie and Cattaraugus counties, N. Y., and Erie county, Pa., to destinations in official classification territory are found unreasonable and ordered reduced in a decision of the Interstate Commerce Commission made public on July 18 based on the Hoch-Smith resolution. The case arose on complaints filed by three co-operative associations of growers and shippers of grapes in the Chautaqua & Erie belt, following the commission's decision reducing the rates on grapes from California, in which they alleged that a depression has existed for a number of years in the grape industry in the belt and that the rates were unreasonable and unduly preferential of shippers of California grapes. The report says that the situation in which the belt farmers find themselves is due almost entirely to causes beyond their control "although it is not contended that this situation can be ascribed to any change in the freight rates from the belt or that any possible reduction in the rates therefrom would afford a complete remedy." The commission finds that the rating and rates will be unreasonable to the extent that they exceed 60 per cent of first class to destinations in central territory and third class to destinations in New England and eastern trunk-line territories but that the railroads may increase the carload minimum to 24,000 pounds. Commissioner McManamy concurred but expressed the opinion that the relief afforded is inadequate.

Claim Payments Decrease

Total freight claim payments during the first quarter of 1928 amounted to $9,203,453 as against a total of $9,783,469 for the first quarter of 1927, a decrease of 5.9 per cent or $580,016 for this year. Claims resulting from robbery declined from $284,215 in the first quarter of 1927 to $257,716 in the corresponding period of the current year. This latter decrease of 9.3 per cent brought down the ratio of robbery to total freight claim payments from 2.9 per cent in the first quarter of 1927 to 2.8 per cent in 1928.

Hearing on Mid-Continent Oil Rates Closed

Hearings on petitions by western railroads particularly the Chicago, Milwaukee, St. Paul & Pacific for modification of the fourth section agreement on mid-continent oil rates originally decided in 1925 were concluded at Chicago by Examiner Disque on July 24. The railroads pointed out that unless they can obtain fourth section relief on rates for petroleum products to points west and northwest of Chicago, they must lose much of the oil traffic. Traffic to points for which relief is asked must now traverse a higher rate territory penalizing receivers of petroleum from southwestern refining districts at points as far west as South Dakota.

Citrus Fruit Rates from Florida Revised Downward

Freight rates on citrus fruit, in carloads, from producing points in Florida to destinations throughout the United States were found unreasonable in a decision made public by the Interstate Commerce Commission on July 30 on a complaint filed by the Railroad Commissioners of Florida on behalf of producers of fruits, vegetables, melons, and berries throughout the state. After a general investigation of the rates on citrus fruits the commission prescribed a new basis of rates which it says involves both increases and reductions, but it finds that the rates were not unreasonable in the past, except that from July 1, to December 1, 1922, from points on the Florida East Coast, they were unreasonable to the extent that they exceeded the rates established December 6, 1922. The case was not based on a claim of economic depression in the industry but on the ground that transportation conditions had changed since the earlier cases in which the commission dealt with these rates, particularly in respect of the marked increase in volume of tonnage and in average loading, and that the time had come for a downward revision, subject to increased carload minima, and for simplification of tariffs.

The rates on oranges and grapefruit to destinations in central Illinois, and southern territories are found unreasonable to the extent that they exceed the contemporaneous sixth-class rates and rates to other groups are based on percentages of corresponding first-class rates, except that for those to transcontinental territory a maximum of $1.80 per hundred pounds is prescribed. The rates are subject to a minimum weight of 32,400 pounds per car and an estimated weight of 90 pounds per standard package. The report says the present rates fall between fifth and sixth class.

Comparisons with the blanket rate of $1.55 from California to points east of the Rocky Mountains, with an addition of 3 cents to New England, are made in the report, and the shippers had requested a joint rate of 95 cents from all producing points in Florida to the more northerly destinations in official territory, but the commission says the rate established by the carriers from California does not warrant it in taking corresponding action as to Florida and that it would never have been justified in establishing the California rate blanket.

Chairman Campbell, concurring in part, objected to the rate of $1.80 to transcontinental territory in view of the $1.55 rate from California to the East and Commissioners Aitchison and Mc Manamy concurred in the expression. Commissioners Meyer, Taylor, Porter and Farrell did not participate in the cases.

Eastern Livestock Rates Ordered Reduced

Reduction in rates on livestock from points in central territory to points in trunk-line and New England territories, locally, and, when from Chicago and the Mississippi and Ohio river crossings, proportionally on traffic from beyond and from certain points in Kentucky and Nashville, Tenn., to trunk-line and New England destinations, are prescribed by the Interstate Commerce Commission in a report and order made public on July 30 in the Eastern Livestock Cases of 1926. Rates prescribed for the future, effective on October 1, are based on a key rate of 50.5 cents from Chicago to New York, in place of the present rate of 56.5 cents, and a distance scale of rates is prescribed for rates in central territory, including Louisville, Ky., which the report says approximates a 12 per cent reduction.

Evidence was presented as to the condition of the livestock industry but the commission does not refer to the Hoch-Smith resolution in its conclusions as to these rates. It says that whereas for nearly five years from 1920 the industry was in a state which might well be described as one of prostration, "at the time of the hearing there had been a return of normal prices; but it would require the continuance of normal prices for a number of years, or of phenomenally high prices for a shorter period to place the industry again upon its feet."

The case also involved rates on fresh meats and packing-house products and their relation to the livestock rates. The commission finds that the rates assailed on these products will not be unreasonable or unduly prejudicial as alleged, when the reduced rates found reasonable for livestock become effective. It also says that "in this proceeding there is no evidence of a depression in the meat-packing industry entitling it to the special consideration which the Hoch-Smith resolution directs shall be given to industries suffering a general depression. Nor is there evidence which convinces us that fresh meats and packing-house products will not continue to move freely under the adjustment resulting from the findings herein."

This language is the same as that used in a proposed report in these cases submitted by Examiner Stiles in April, 1927, and the statement regarding the condition of the livestock industry is taken from his report with the omission of a prediction that reductions in the rates on livestock would increase the buying power of the eastern buyers.

Examiner Stiles, however, had recommended a reduction of the key rate on livestock grounded on the Hoch-Smith resolution, finding that 50.5 cents would be a "maximum resonable rate" under Section 1 but that 48.5 cents would be in compliance with the resolution.

Commissioner Woodlock dissented on the ground that the reduction was based on fallacious comparisons with other rates and defective computations as to cost of transportation. Commissioner Taylor dissented because the rates were ordered reduced and said that the producers would not benefit. Commissioner Mc Manamy also dissented and Commissioners Meyer, Lewis and Farrell did not participate in the disposition of the case, so the majority report represents the votes of five commissioners.

Equipment and Supplies

Locomotives

THE NEW YORK CENTRAL is inquiring for 55 locomotives; 30 of the 4-6-4 type and 25 of the 4-8-2 type.

THE INTERNATIONAL RAILWAYS OF CENTRAL AMERICA have ordered 2 heavy Mikado type locomotives from the Baldwin Locomotive Works.

THE MANILA RAILROAD has ordered 4 three-cylinder Mikado type locomotives from the Baldwin Locomotive Works. This is a duplicate order for 4 locomotives, an order having been placed with the same builder earlier this year.

Freight Cars

THE PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS is inquiring for 1 special flat car.

THE CHESAPEAKE & OHIO is inquiring for 500 hopper car bodies of 70 tons' capacity.

THE NEVADA CONSOLIDATED COPPER COMPANY is inquiring for 20 Ingoldsby type ore cars, of 60 tons' capacity.

THE UNITED STATES NAVY, BUREAU OF SUPPLIES & ACCOUNTS, has ordered 2 gondola cars from the Pressed Steel Car Company.

THE LEHIGH & NEW ENGLAND has ordered 3 eight-wheel steel underframe caboose cars from the Pressed Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of June 16.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 10 air-dump cars from the Western Wheeled Scraper Company. Inquiry for this equipment was reported in the *Railway Age* of July 14.

THE CHICAGO & EASTERN ILLINOIS has ordered 100 single sheathed automobile cars of 40-ton capacity from the Mt. Vernon Car & Manufacturing Co. Inquiry for this equipment was reported in the *Railway Age* of July 7.

Passenger Cars

THE CHICAGO, BURLINGTON & QUINCY will build 33 steel suburban passenger cars at its Aurora, Ill., shops.

THE CHICAGO GREAT WESTERN has ordered three baggage and mail cars from the Pullman Car and Manufacturing Corp. Inquiry for this equipment was reported in the *Railway Age* of June 16.

THE CANADIAN NATIONAL has ordered 3 steel combination baggage and mail cars from the American Car & Foundry Company. These cars are for service in the United States. Inquiry for this equipment was reported in the *Railway Age* of June 9.

THE PENNSYLVANIA has ordered 550 all-steel express refrigerator cars of new design. The order, amounting to approximately $5,000,000, was divided among four companies, as follows: American Car & Foundry Co., 200 cars; Pressed Steel Car Company, 200 cars; Pullman Car & Manufacturing Corp., 100 cars; and the General American Car Company, 50 cars.

Iron & Steel

THE GREAT NORTHERN has ordered 4,000 tons of rail from the Inland Steel Company and the Bethlehem Steel Company, and 4,000 tons from the Illinois Steel Company.

THE NORFOLK & WESTERN has placed orders for 40,000 tons of steel rail divided as follows: To the United States Steel Corporation, 29,000 tons and to the Bethlehem Steel Company, 11,000 tons.

Machinery and Tools

THE MISSOURI PACIFIC has ordered one 20-ton gantry crane for use at Wichita, Kan., from the Whiting Corporation.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for one 300-ton hydraulic sectional flanger, one 8 in. by 24 in. vertical spindle surface grinder and one pipe threading machine.

THE RAILROAD COMPANIES have placed orders with the Niles-Bement-Pond Company for machine tools as follows: A 90-in. journal turning lathe and a Long & Allstatter No. 6 vertical bar iron shear.

Signaling

THE PITTSBURGH & LAKE ERIE has contracted with the Union Switch & Signal Company for the necessary material for the installation of a type F, electric interlocking at Beck's Run, Homestead, Pa. The plant includes a 55-lever interlocking machine, 45 light signals, 23 electric switch movements with necessary accessories, including relays, transformers, rectifiers, etc. for the complete installation of the plant. The field installation work will be carried out by the railroad company's signal forces.

THE INTERBOROUGH RAPID TRANSIT COMPANY has placed orders with the Union Switch & Signal Company for a 19-lever electro-pneumatic interlocking machine for installation at Freeman street, New York City, and also for alternating current block signaling materials for the White Plains elevated line, comprising 90 color-light signals, 80 electro-pneumatic automatic train stops, 275 relays with necessary switch movements, transformers, instrument cases and other attendant apparatus.

Supply Trade

The Reynolds Electric Company, Chicago, has taken over the **Konectolite Company.**

J. L. Lavallee has been appointed assistant manager of the railway sales division of the **Texas Company,** with headquarters at New York.

Elliott E. Van Cleef, 53 W. Jackson boulevard, Chicago, has been appointed district sales agent in the Chicago territory for the **Roller-Smith Company** of New York.

William Hunter, acting manager of the **Niles-Bement-Pond Company,** with headquarters at Philadelphia, Pa., has been appointed manager of the Philadelphia office.

C. J. Olmstead, western manager, **Westinghouse Air Brake Co.,** with headquarters at Chicago, has been appointed assistant to the vice-president. He will be succeeded by **C. D. Foltz,** who has been assistant western manager. **A. K. Hohmeyer** has been appointed assistant western manager.

The **National Accessories Company,** with offices at 214 Harrison building, Philadelphia, Pa., has been formed by **J. J. Voigt, Jr.,** formerly of the E. A. Lundy Company, and **P. M. Etters,** formerly of the Thomas L. Mount Company, to deal in railway signal and electrical accessories.

A. M. Castle & Co., Chicago let a contract for a large addition to its present San Francisco Cal. unit, on Indiana street. The new bay is to be 70 ft. wide by 600 ft. long, and will be erected on the west side of the present warehouse. The building will be a steel frame structure with corrugated iron walls and roof. Two traveling overhead electric cranes will serve the bay. The equipment for this bay includes a mill type gate shear; a hign-speed saw for cutting structural material; a bulldozer for straightening shapes and a guillotine angle bar and universal plate shear.

H. A. Mullet, who has been elected president of the **Bradley Washfountain Company,** Milwaukee, Wis., was born at Louisville, Ky., on December 11, 1880, and attended high school at Kansas City, Mo. In 1904 he graduated from a course in electrical engineering at Rose Polytechnic Institute and in the same year entered the service of the Westinghouse Electric and Manufacturing Company at Pittsburgh, Pa., In 1906 Mr. Mullet was appointed assistant to the superintendent of equipment of the Milwaukee Electric Railway and Light Company. Later he was promoted to superintendent of equipment and in 1918 he was promoted to assistant general manager of the transportation department, his jurisdiction being extended in the following year to in-

clude motor coach operations. From 1922 to 1925 Mr. Mullet acted as vice-president and general manager of the Milwaukee Northern, a subsidiary of the Milwaukee Electric Railway and Light Company, then becoming vice-president of the Yellow Cab Company, Chicago. In 1926 he was elected vice-president of the Twin City Rapid Transit Company, Minneapolis. Minn.

D. J. McCarthy, chief engineer of the **Chicago Railway Signal & Supply Co.,** Chicago, has been appointed vice-president and general sales manager. Mr. McCarthy succeeds **Charles O. Poor,** who resigned as vice-president and general manager on July 1 to engage in other business. **Arthur C. Dunne,** resident manager at Chicago, has been appointed western sales manager, with headquarters at Chicago.

Mr. McCarthy's experience in the railway signal field extends over a period of 27 years, 17 of which were spent with the Union Switch and Signal Company as designing, research and field engineer. He has been chief engineer of the Chicago Railway Signal & Supply Co. since 1918.

Mr. Dunne obtained his first experience in the signal field with the Federal Signal Company, being promoted to western sales manager of that company in 1909. In 1913 Mr. Dunne was appointed superintendent of construction, resigning in 1914 to become sales engineer for the Chicago Railway Signal & Supply Co. During the World war he served as a second lieutenant in the signal corps of the United States Army. Mr. Dunne was promoted to resident manager at Chicago in 1926.

Trade Publications

PURE IRON PLATE.—Complete information concerning the physical properties, weldability, rust resistance, and uniformity of Armco ingot iron is contained in the 20-page booklet of the American Rolling Mill Company, Middletown, O. Armco pure iron plates are now available in all commercial sizes and thicknesses.

AMERICAN MULTIPLE THROTTLE.—The general construction of the American multiple throttle is described and its advantages explained in Bulletin No. 3 issued by the American Throttle Company. 17 East Forty-second Street, New York. Typical application layouts with Type A and Type E superheaters are shown.

STEAM TABLES.—The properties of saturated and superheated steam, from 0.0886 to 3,300 lb., absolute pressure, are given in the booklet of steam tables published by the Superheater Company, 17 East 42nd street, New York. A heat-entropy diagram is also included among these tables which have been reprinted from the new seventh edition of the handbook entitled "Superheat Engineering Data."

TORFOLEUM.—The practical characteristics of Torfoleum, a material designed to meet a wide range of insulating and sound deadening needs, are described in the 16-page booklet issued by Pennrich & Co., Inc., 29 Broadway, New York. The illustrations show its application to various types of construction, including refrigerator cars, cold storage plants, public buildings, etc.

Obituary

Donald C. Davis, mechanical engineer of the Gould Coupler Company, died on July 31 at his home in Buffalo, N. Y.

Johan M. Anderson, president of Albert & J. M. Anderson Manufacturing Company, Boston, Mass., died at his home in Brookline, Mass., on July 25 at the age of 72.

James McNaughton, vice-president of the Baldwin Locomotive Works, in charge of the New York office, who died on July 27 at his home in Bronxville, N. Y., was born on August 6, 1859 in Queensville, Ont. At the age of 14 he went to Woodbridge, Ont., to become apprenticed to a manufacturer there. Five years later he moved to the United States, and in 1881 entered the employ of the Northern Pacific as shop foreman at Brainerd, Minn. In 1889, he became division superintendent of rolling stock on that road, with headquarters at Livingston, Mont. The following year he went to Waukesha, Wis. to become superintendent of motive power on the Wisconsin Central (now

James McNaughton

a part of the Minneapolis, St. Paul & Sault Ste. Marie). He remained with this road until 1899 when he became superintendent of the Brooks Locomotive Works at Dunkirk, N. Y. With the formation of the American Locomotive Company he became general manager of the Brooks and Schenectady plants in 1902. In 1904 he became general manager of the American Locomotive Company at Schenectady, and in 1910 was made vice-president in charge of manufacture. He resigned to become president of the Eddystone Munitions Company at Eddystone, Pa., in 1915, and remained with this concern until 1920, when he became vice-president of the Baldwin Locomotive Works.

Construction

BALTIMORE & OHIO.—A contract for the erection of water stations and treating plants at Green Spring and Sir Johns Run, W. Va., has been awarded, by this company, to Frainie Brothers & Haighley, Baltimore, Md.

CANADIAN NATIONAL.—A contract has been awarded to the Ryan Construction Company, Vancouver, B. C., for the construction of a 14-story reinforced concrete and steel hotel at Vancouver. Actual construction is expected to start about October 1.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has applied to the Interstate Commerce Commission for authority for the construction of an extension from Quinn, Ark., in a southeasterly direction about 6 miles.

COLORADO & SOUTHERN.—This road has let a contract to Roberts and Shaefer Company, Chicago, for the construction and installation of a two-track electric cinder plant at Denver, Colo.

DELAWARE & HUDSON.—Bids were opened on July 18 by this road for the elimination, by underpass construction, of the Delmar-Elemere grade crossing in Albany County, N. Y., the estimated cost of which exclusive of land damage is $154,700. The land to be taken has been appraised at $18,400. The bids are subject to approval by the Public Service Commission.

DELAWARE, LACKAWANNA & WESTERN.—This road has awarded a contract to the James A. Hart Company, New York, for the sub-structure of its new passenger station at Lyndhurst, N. J. This work is expected to cost approximately $35,000.

ERIE.—This company plans to erect a new station on the line of New York, Susquehanna & Western at Pompton Lakes, N. J.

GEORGIA SOUTHWESTERN & GULF.—This company has applied to the Interstate Commerce Commission for authority to build an extension of 4 miles from Raines to Armstrong, Ga.

HARBOR BELT LINE.—The Board of Harbor Commissioners of Los Angeles, Cal., has approved the purchase of 300 acres of land between Watson station and Anaheim boulevard, east of Truck boulevard, Los Angeles, for $1,800,000 for the future construction of a classification yard.

KANSAS CITY SOUTHERN.—The office of the United States District Engineer at Kansas City, Mo., has recommended to the War department approval of the plans of this company for the construction of a

vertical lift bridge over the Missouri river at Randolph, Mo.

LOUISVILLE & NASHVILLE.—This company plans the construction of a two-story passenger station at Bay St. Louis, Miss., at a cost of about $50,000 to replace the building recently destroyed by fire. The station will have outside dimensions of 30 ft. by 125 ft.

NORTHERN PACIFIC.—This company is completing plans for the construction of a shop at Laurel, Mont., to be used for the repair of steel cars, which is estimated to involve an expenditure of $160,000. Company forces are to be employed in the construction of a stockyard at Laurel to cost about $40,000.

PENNSYLVANIA. — Contracts involving estimated expenditures of $430,000 have recently been awarded by this road; the largest, involving $310,000, was awarded to the Newton A. K. Bugbie & Co., Inc., Trenton, N. J., for the erection of inbound and outbound freight houses, a bridge, platforms and shelters in connection with a new freight house at Trenton. A second contract for steel work in connection with the auction house at the new produce terminal development in Pittsburgh was awarded to the Jones & Laughlin Steel Corporation, Pittsburgh. Approximately $65,000 is involved in this contract. A third contract for the construction of an undergrade bridge in connection with the elimination of a grade crossing on the Sherman-Mayville road, Mayville, N. J., was awarded to the Milliron Construction Company, Du Bois, Pa. The estimated cost of the work is $55.000.

PITTSBURGH, LISBON & WESTON.—C. V. Burnside, assistant director of the Bureau of Finance of the Interstate Commerce Commission, has submitted a proposed report recommending that the Commission grant this company's application for authority to construct two extensions, from Smith's Ferry, Pa., on the Ohio river, to Negley, Ohio, 13.3 miles, and from Mill Rock to the vicinity of Youngstown, Ohio, 28.4 miles, for the purpose of establishing a through route for the transportation of bituminous coal from the Pittsburgh and Connellsville districts to the Youngstown district, in connection with barge lines on the Ohio and Monongahela rivers. The report also recommends that the commission grant the application of the Montour to acquire control of the Lisbon company, both companies being controlled by the Pittsburgh Coal Company.

SOUTHERN PACIFIC.—In an application to the Interstate Commerce Commission this company asks for certificates authorizing the construction of a line of 5.64 miles from San Jose to Lick Station, Calif., and the abandonment of 1.12 miles of line at San Jose.

TURLOCK & EASTERN.—This company has been formed to construct a line between Turlock, Cal., and a connection with the Atchison, Topeka & Santa Fe at Cortez, about five miles. The cost of the line is estimated at $250,000.

Financial

ALGERS, WINSLOW & WESTERN.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to construct and/or acquire a 15-mile line of railroad in Pike county, Ind., connecting with the Evansville, Indianapolis & Terre Haute at Littles and with the Southern south of Globe. The former company is a subsidiary of the Cleveland, Cincinnati, Chicago & St. Louis. The commission's certificate carries the proviso that the new company, which will open up coal lands, must sell out to the Big Four and the Southern at a fair price at any time during a ten-year period if the latter-named roads wish to acquire it. This certificate will not become effective until further figures are developed regarding construction costs and cost of that part of the line to be acquired from a coal company.

CASEY & KANSAS. — *Acquisition.—This* company has applied to the Interstate Commerce Commission for authority to purchase a line formerly owned by the Westfield Railroad, from Kansas to Casey, Ill., 20 miles, for $100,000 in securities.

CHESAPEAKE WESTERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon that portion of its line from Mt. Solon, Va., to North River Gap, 4.8 miles.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $540,000 of 4¾ per cent equipment trust certificates, to be used in connection with the purchase of 8 switching locomotives and 200 flat cars.

DETROIT, TOLEDO & IRONTON.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and deliver to Henry Ford, its principal stockholder, $660,000 of first mortgage 50-year 5 per cent bonds to secure money advanced for the purchase of land and other expenses in connection with improvements to its yard at Lima, Ohio.

GULF & SABINE RIVER.—*Abandonment.*—In an application to the Interstate Commerce Commission, this company asks authority to abandon its line, which extends from Nitram to Fullerton, La., approximately 6 miles.

HOOSAC TUNNEL & WILMINGTON.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $75,000 of 6 per cent first mortgage bonds, to provide funds for the rebuilding of a trestle or bridge at Mountain Mills, Vt., which was washed away by the November, 1927, flood, and to reimburse the treasury for money heresubdivision of the Southern division. Mr.

HOUSTON & BRAZOS VALLEY.—*Bonds.*—The Interstate Commerce Commission has made public a proposed report by Examiner A. C. Devoe recommending that the commission authorize an issue of $1,398,000 of first mortgage bonds, to be delivered to the New Orleans, Texas & Mexico, in part satisfaction of an indebtedness to that company amounting to $1,823,889 and of advances aggregating $639,902. The company had asked authority to issue $1,823,000 of the bonds, but the report says that part of the indebtedness represents advances made to meet operating deficits and recommends that the amount be reduced by eliminating from the basis for the proposed bonds $413,899 of interest and $11,152 of unallocated investment over liabilities.

KLICKITAT LOG & LUMBER COMPANY.—*Abandonment.*—This Company has applied to the Interstate Commerce Commission for authority to abandon operation in interstate commerce of a line from Klickitat to Plateau, Wash., 16 miles, which has been operated almost entirely as a logging road.

LONG ISLAND.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate in interstate commerce the property of the Degnon Terminal, which has a short track connecting with the Montauk freight cut-off of the Long Island at Long Island City, N. Y., at a price of $75,000.

LOUISVILLE & NASHVILLE.—*Lease.*—This company has applied to the Interstate Commerce Commission for authority to acquire control by lease of the Louisville, Henderson & St. Louis, which extends from Evansville, Ind., to Louisville, Ky., 199 miles. The L. $ W. owns most of its capital stock.

MCCLOUD RIVER. — *Lease.*—Application has been made to the Interstate Commerce Commission for authority for an extension by leasing a spur track of the McCloud River Lumber Company from Slagger Creek to Pondosa, Calif., 7.81 miles.

MINNEAPOLIS & ST. LOUIS.—*Receiver's Certificates.*—The Interstate Commerce Commission has granted authority to the receiver of this company to issue a receiver's certificate to the amount of $200,000 to renew a previous one of like amount falling due.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*New Directors.*—F. T. Heffelfinger, president of F. H. Peavey & Co., Minneapolis, Minn., and F. J. Sensenbrenner of the Kimberly Clark Company, Neenah, Wis., have been made directors.

MONTOUR.—*Acquisition.*—The Interstate Commerce Commission has made public a proposed report by C. V. Burnside, assistant director of its Bureau of Finance, recommending the granting of this company's application for authority to acquire control of the Pittsburgh, Lisbon & Western, which is also controlled by the Pittsburgh Coal Company, by purchase of its capital stock for $425,000.

(*Continued on page 245*)

Annual Report

Great Northern Railway Company

Excerpts From Annual Report, Year Ended December 31, 1927

Capital Stock

There has been no change during the year in the authorized capital stock, which remained at $250,000,000, and of which there had been issued to December 31, 1927 ..... $249,680,650

Of this latter amount there was held in the Treasury $713,400, the amount actually outstanding in the hands of the public being $248,967,250, an increase of $32,300 during the year. This increase represents $60,100 fully paid and issued stock subscribed for at par by residents of the territory served by the extension west of Scobey, Montana, the construction of which was completed last year and the return to the treasury of $27,800 formerly held by the Great Northern Employees' Investment Company, Limited.

Funded Debt

There was an increase of $9,313,700 in the funded debt, as follows:

By issue of the Company's General Mortgage 4½ per cent. Gold Bonds, Series "E," dated July 1, 1927, maturing July 1, 1977		$20,000,000
Less		
Company's General Mortgage 7 per cent Gold Bonds, Series "A," acquired during the year at a total cost of $10,402,537.51, average price paid 113.8. Par value	$9,141,000	
Notes maturing and paid during 1927, under the various equipment trust agreements	1,545,300	10,686,300
Net increase		$9,313,700

Unified Operation of Great Northern Railway Company and Northern Pacific Railway Company

Applications for approval of the plan for the unification of Great Northern Railway Company, Northern Pacific Railway Company and Spokane, Portland and Seattle Railway Company, to which reference was made in the last Annual Report, are still pending before the Interstate Commerce Commission. In the period from October 24, 1927, to March 21, 1928, hearings were held by the Commission at Minneapolis, St. Paul, Tacoma, and Washington, D. C. At these hearings more than 4,000 pages of testimony and 288 exhibits were presented, testimony both for and against the applicants being heard.

The evidence at the hearings showed that the proposed unification would result in operating economies amounting to more than $10,000,000 annually and that also in other important respects the public interest would be promoted by the unification.

A brief on behalf of the applicants was filed with the Interstate Commerce Commission on June 5, 1928, and all answering briefs, as well as briefs in reply to the latter, must be filed before August 5, 1928.

Valuation

In November, 1927, the Interstate Commerce Commission issued an order declaring the "final value" of the Great Northern Railway Company's property as of June 30, 1915, to be $383,580,815 for property owned for transportation purposes and $387,084,437 for property used for transportation purposes. These values are based upon pre-war costs of reproduction less depreciation. They do not include the value of noncarrier physical property, stocks and bonds of other companies, including those of the Chicago, Burlington & Quincy Railroad Company, Spokane, Portland and Seattle Railway Company and the Canadian companies, and other assets. Final values have also been declared for all of the system subsidiaries in the United States which were in existence March 1, 1913, the date of passage of the Valuation Act, and for the Chicago, Burlington & Quincy Railroad. These values, plus additions and betterments since valuation dates and the ledger value of assets not valued by the Commission show an equity for Great Northern stock in excess of $200.00 per share.

Summary of Operating Income for the Years 1927, 1926 and 1925

Item	1927	1926	1925
Average mileage of road operated...	8,164.14	8,188.21	8,242.09
Transportation revenue	$114,035,490	$113,261,096	$110,963,697
Incidental operating revenues	3,868,515	4,122,813	3,961,263
Total railway operating revenue.	$117,904,005	$117,383,909	$114,924,960
Railway operating expenses	78,355,580	75,285,464	75,827,288
Net revenue from railway operations	$39,548,425	$42,098,445	$39,097,672
Railway tax accruals	9,046,049	9,699,807	9,801,946
Uncollectible railway revenues	Cr. 228	15,339	7,844
Railway operating income	$30,502,604	$32,383,299	$29,287,882
Equipment rents—net	Dr. 994,896	Dr. 808,498	Dr. 726,135
Joint facility rents—net	Dr. 305,168	Dr. 294,372	Dr. 285,564
Net railway operating income ..	$29,202,540	$31,280,429	$28,276,183
Ratio of expenses to revenues (per cent.)	66.5	64.1	66.0

The decrease in the net railway operating income was primarily caused by an increase of over $2,000,000 in the equipment depreciation accounts under operating expenses.

Passenger Traffic

There was a decrease of 2½ per cent in the total passenger revenue compared with 1926. The increasing use of improved highways by private automobiles continues.

Effective November 1, 1927, the Great Northern entered into an agreement with the Northern Pacific and the Minneapolis, St. Paul and Sault Ste. Marie Railway Companies, whereby the passenger service between the Twin Cities and the Head of the Lakes was pooled. Each company eliminated one daily round trip train, which resulted in a saving for the Great Northern of approximately 117,000 train miles per annum.

A considerable saving was made through the increased use of rail motor cars, which operated 1,298,811 passenger train miles in 1927 compared with 690,290 miles in 1926.

Freight Traffic

A synopsis of the tons of freight moved and revenue received for the years 1927 and 1926 is given in the table at the bottom of this page.

The revenue from grain increased over $4,000,000, the movement in 1927 amounting to 139,000,000 bushels or an increase over 1926 of 20,000,000 bushels. The movement of apples in 1927 amounted to 16,277 cars as compared with 19,746 cars in 1926, resulting in a decrease in revenue of more than $1,000,000. Shipment of cattle in 1927 decreased 4,000 cars or 17 per cent. In 1927 the company handled 12,989,208 long tons of iron ore compared with 14,667,028 long tons handled in the year 1926, which accounts for the entire decrease in products of mines shown in the table above. The increase in manufactures and miscellaneous is principally in the movement of refined petroleum and its products and agricultural implements.

	1927		1926		Increase—I Decrease—D	
Commodity	Tons	Gross Revenue	Tons	Gross Revenue	Tons	Gross Revenue
Products of agriculture	6,101,472	$28,610,074	5,288,954	$24,906,209	I 812,518	I $3,703,865
Animals and products	557,299	4,316,897	605,268	4,770,466	D 47,969	D 453,569
Products of mines	19,375,241	18,855,937	21,125,011	20,114,477	D 1,749,770	D 1,258,540
Products of forests	3,684,302	14,366,922	4,106,394	15,909,305	D 422,092	D 1,542,383
Manufactures and miscellaneous	4,124,694	28,255,200	3,992,302	27,646,283	I 132,392	I 608,917
Total	33,843,008	$94,405,030	35,117,929	$93,346,740	D 1,274,921	I $1,058,290

Northland Transportation Company

The Northland Transportation Company, a subsidiary of the Great Northern Railway Company, has continued its process of consolidating smaller bus companies.

During the year 1927 there were handled 2,596,692 passengers or an increase over the year 1926 of 621,668. This increase was partly due to the mileage purchased and partly to the increase in patronage of the buses. The service has been coordinated with the passenger service of the Railway Company in order to handle both with a minimum expense.

Group Insurance

The Company has experienced another successful year under the various plans of group insurance placed with the Metropolitan Life Insurance Company. At the close of the year there were approximately 7,750 employees insured with an aggregate life insurance in force of $14,200,000 with the same amount of accidental death and dismemberment insurance. Some of the plans also provide for weekly indemnity for sickness and accident. The premiums are borne jointly by the company and the employees.

Maintenance of Track, Structures and Equipment

The charges for maintenance in 1927, both Way and Equipment amounted to $34,906,685 compared with $31,996,875 in 1926 and $31,498,206 in 1925. The increase of nearly $3,000,000 over the charges for 1926 is made up of an increase of $672,096 Maintenance of Way and $2,237,714 Maintenance of Equipment. The increase in Maintenance of Equipment is almost entirely attributable to the change to 4% depreciation compared with 2% in 1926. Equipment and fixed property both have been improved by the addition of new units and maintaining the existing property at standards consistent with the latest practice on the best American Railways. The program which has been consistently followed for the past few years of relaying with 130 and 110 lb. rail, applying washed ballast and treated ties was carried on in 1927. The average cost of ties has increased due largely to using treated ties exclusively.

In Maintenance of Equipment the aim has been to continue to improve the serviceability of the equipment and to bring the condition of the freight equipment up to as high a standard as possible, especially at the time of the peak demand in the fall. The condition of the locomotives and freight cars as of October 1, in the years 1925, 1926 and 1927 is shown by the figures below:

	Percentage of Locomotives Awaiting Shop	Percentage of Bad Order Freight Cars
October 1, 1925	13.4	5.8
October 1, 1926	11.6	4.8
October 1, 1927	10.7	3.3

Extension of Line to Klamath Falls, Oregon

On January 24, 1928, the Interstate Commerce Commission issued its final order authorizing the Great Northern Railway Company to operate over the lines of the Spokane, Portland and Seattle Railway Company, the Oregon Trunk Railway and the Deschutes Railroad Company, in Washington and Oregon; to acquire an undivided three-fourths interest in the railroad of the Shevlin-Hixon Company extending southerly from Bend, Oregon; to construct a line from the southerly end of the Shevlin-Hixon Company's railroad to a point at or near Chemult, Oregon; to operate over the line of the Southern Pacific Company between a point at or near Chemult and Klamath Falls, Oregon, and to acquire control, jointly with the Southern Pacific Company, of the Oregon, California and Eastern Railway Company by purchase of capital stock. The total mileage operated by the Oregon, California and Eastern Railway Company is approximately fifty miles and its principal termini are Klamath Falls and Sprague River Landing, Oregon. The contracts made with the Southern Pacific give the Great Northern half ownership, or its equivalent in long term trackage rights, of all the railway lines in the Klamath Basin except those owned by logging and lumber companies, and except that at Klamath Falls the Great Northern and Southern Pacific each has its own terminals.

Saco-Turner Line

Construction has been started on a new line of railroad extending in a northwesterly direction from Saco, Montana, a distance of 78 miles. The territory to be served has about 1,000,000 acres of tillable land and 400,000 acres of grazing land. At the present time there are in this area approximately 550 farmers who have under cultivation some 260,000 acres. The area is adapted to general agriculture and live stock. When transportation facilities are provided, dairying and mixed farming will be engaged in extensively. It is expected that the line will be opened for operation in time to move the 1928 crop.

Changes of Line and Electrification in the Cascade Mountains

In the annual reports of 1925 and 1926, reference has been made to the construction of a 7.79 mile tunnel in the Cascade Mountains and extending the electrification to Wenatchee on the east and Skykomish on the west. The pioneer tunnel (which is an 8 x 9 bore for construction purposes alongside the main tunnel) was holed through on May 1, 1928, the final blast being fired by the President of the United States from the White House, on which occasion he made the following statement:

> "This artery of transportation, the longest tunnel in the Western Hemisphere, is of importance not alone to the State of Washington and the Great Northern Railway Company, but to industry and agriculture generally, and indirectly to each and every one of us. My congratulations go to those who have made it possible."

In addition there has been in progress during the year the construction of a change of line, 17 miles in length, extending from Peshastin to Winton, Washington, on the east slope of the Cascades, which will be ready for use by November, 1928. It is expected that shortly thereafter and by the end of the year trains will be operated through the long tunnel, and that the electrification will be completed by that time, so that the entire reconstruction and electrification of the line over the Cascade Mountains will be accomplished by the end of 1928.

The new tunnel together with the other improvements being made between Wenatchee and Everett will substantially better the Great Northern Railway which already possesses such outstanding physical advantages, and will further perfect the line which affords the shortest, straightest, and easiest way from the Great Lakes to the Pacific Ocean. Thirty-five miles of winding mountain line with curvature enough to make twelve complete circles will disappear forever from railway operation. Twenty-five miles of nearly straight line crossing the Cascade Mountains on easier grades at five hundred feet lower altitude will take its place. The line for seventy-five miles between Wenatchee and Skykomish will be operated electrically.

Financial

(*Continued from page 243*)

Old Colony.—*Bonds.*—In an application to the Interstate Commerce Commission this company asks authority for an issue of $927,400 of common stock to be sold at public auction at not less than par and the proceeds to be used to pay the New York, New Haven & Hartford for permanent improvements on the property of the Old Colony.

Oregon Electric.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon operation of a branch line from West Woodburn to Woodburn, Ore., 2.3 miles.

Pennsylvania.—*Stock Issue Authorized.*—Division 4 of the Interstate Commerce Commission, on July 31 authorized the proposed issue of $17,500,000 of common stock to be offered for subscription at par for cash by officers and employees.

Pere Marquette.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon the What Cheer mine spur, approximately 4 miles, in Saginaw and Bay counties, Mich.

Peoria & Eastern.—*Annual Report.*—The annual report for 1927 shows net income after interest and other charges of $409,051 as compared with net income in 1926 of $380,015. Selected items from the income statement follow:

Peoria & Eastern

	1927	1926
Average mileage operated	211.44	211.44
Railway Operating Revenues	$3,902,748	$4,009,273
Maintenance of way	537,898	593,872
Maintenance of equipment	724,665	828,628
Transportation	1,606,152	1,568,380

Total Operating Expenses	3,113,664	3,226,288
Operating ratio	79.78	80.47
Net Revenue from Operations	789,084	782,985
Railway tax accruals	218,696	211,478
Railway operating income	569,747	569,183
Equipment rents, Net Dr.	136,255	173,904
Joint facility rents, Net Dr.	53,668	46,587
Net Railway Operating Income	379,823	348,693
Non-operating income	46,664	53,690
Gross Income	426,487	402,383
Interest on funded debt	404,676	401,716
Total Deductions from Gross Income	17,436	22,367
Net Income	409,051	380,015
Surplus for year carried to profit and loss	116,649	164,139

Portland & Ogdensburg.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $2,119,000 of 4½ per cent first mortgage bonds to refund an issue of like amount due November 1. The Maine Central asked authority to guarantee the bonds and the Portland Terminal Company to consent to the issue. It is proposed to sell the bonds on competitive bids at not less than 96.

Southern Pacific.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $4,815,000 of 4½ per cent equipment trust certificates, to be sold to Kuhn, Loeb & Co., at 98.25 and accrued dividends. The application states that bids were invited from 60 banks and bankers and that three were received, representing nine banks and bankers, but all were rejected as the highest was 97.25.

Wadley Southern.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon that portion of its line between Kite, Ga., to Rockledge, 22 miles.

Wichita Falls & Southern.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $3,500,000 of first mortgage and collateral lien 5 per cent bonds, $1,417,000 to be exchanged for other bonds and the balance to be sold at not less than 90.

Wabash.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Lake Erie & Fort Wayne, by purchase of its capital stock. The Wabash now owns 1,050 shares and proposes to acquire the remaining 2,950 shares at $25 a share.

Western of Alabama.—*Bonds.*—In an application filed with the Interstate Commerce Commission, this company asks authority to issue $1,543,000 of first mortgage 4½ per cent bonds, for the purpose of retiring a like amount of consolidated mortgage bonds outstanding, to be sold at not less than 95.

Western Pacific.—*Acquisition.*—The Sacramento Northern, a subsidiary of the Western Pacific, has applied to the Interstate Commerce Commission for authority to acquire the lines of the San Francisco-Sacramento interurban electric railroad, connecting Oakland and Sacramento, Calif., with a branch to Pittsburg, 87 miles, at a price of $1,675,100.

Western Pacific.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $5,000,000 of 5 per cent first mortgage bonds, to reimburse the treasury and to be applied toward the improvement of existing facilities. It is proposed to offer the bonds for competitive bidding and the Western Pacific Railroad Corporation is expected to bid.

Valuation Reports

The Interstate Commerce Commission has issued final valuation reports finding the final value for rate-making purposes of the property owned and used for common-carrier purposes, as of the respective valuation dates, as follows:

Columbia, Newberry & Laurens	$1,807,000	1918
Grand Trunk of Canada	2,858,000	1917
Grand Trunk Western	26,500,000	1917
Detroit, Grand Haven & Milwaukee	12,500,000	1917
Pontiac, Oxford & Northern	1,487,800	1917
Toledo, Saginaw & Muskegon	1,390,000	1917
International Bridge Co.	1,050,000	1917
Grand Trunk-Milwaukee Car Ferry	630,000	1917
Detroit & Huron	226,500	1917
St. Clair Tunnel Co.	1,700,000	1917
Houston Belt & Terminal	3,922,500	1916

Dividends Declared

Bangor & Aroostook.—Common, $0.88, quarterly; preferred, 1¾ per cent, quarterly, both payable October 1 to holders of record August 31.

Lackawanna Securities Corporation.—$3., payable September 1 to stock of record August 15.

Maine Central.—$1., quarterly, payable October 1 to holders of record September 15.

Maine Central.—Preferred, $1.25, quarterly, payable September 1 to holders of record August 15.

New Orleans, Texas & Mexico.—$1.75, quarterly, payable September 1 to holders of record August 15.

New York, Chicago & St. Louis.—Common, $1.50, quarterly; preferred, $1.50, quarterly, both payable October 1 to holders of record August 15.

Texas & Pacific.—Common, $1.25, quarterly, payable October 1 to holders of record August 31.

Average Prices of Stocks and of Bonds

	July 31	Last week	Last year
Average price of 20 representative railway stocks.	118.79	117.46	121.26
Average price of 20 representative railway bonds.	92.50	92.59	94.44

The direct overland rail route which existed before the war from western Europe to the Orient via Siberia was reopened with the recent publication of the through passenger and baggage tariffs. Passengers may now obtain direct through-tickets from Germany to any station in Asiatic Russia, Japan or China and may check baggage to destination. The resumption of service had been delayed pending conclusion of the German-Polish treaty which was concerned with passenger service through the Polish Corridor. The overland trip from Berlin to Tokio takes 14 days while a second-class ticket costs the equivalent of $1.30. Because of uncertain conditions in that country, Chinese railroads are not participating in the through tariff.

Officers

Executive

Alexander C. Shand, assistant to the vice-president on the Pennsylvania, with headquarters at Philadelphia, Pa., has retired from active railroad service under the pension regulations, effective August 1. Mr. Shand was born on July 1, 1858, at Lesmahagow, Lanarkshire, Scotland, and was educated at Anderson University, Glasgow. He entered railway service in 1879 in connection with location and construction work on the Pennsylvania at Connellsville, Pa. He was in charge of construction of the Torrens shops until 1881 and from February, 1882, until August, 1884, he was assistant supervisor and engineer in charge of location and construction of branches on the Southwest Pennsylvania (now a part of the Pennsylvania). From the latter date until 1889, he was supervisor of the Altoona yard and he then became assistant engineer maintenance of way at Altoona, which position he held until August, 1900. On the

Alexander C. Shand

latter date Mr. Shand became principal assistant engineer of the Pennsylvania and the following year he was appointed superintendent of the Altoona division, which position he held until June, 1903, when he was appointed engineer maintenance of way. From April, 1905, until March, 1906, he was assistant chief engineer and from the latter date until March 1920, he served as chief engineer of the lines East of Pittsburgh and Erie. He became chief engineer of the Pennsylvania System at Philadelphia, on March 1, 1920, serving in that capacity until February, 1927, when he was appointed assistant to the vice-president, being assigned to special engineering duties in connection with the company's plans for the new Philadelphia passenger station. Mr. Shand's entire railroad service was with the Pennsylvania, having served with that road for 49 years.

Financial, Legal and Accounting

William L. Grubbs, secretary to the general solicitor of the Louisville & Nashville at Louisville, Ky., has been promoted to commerce attorney, with headquarters at the same point.

F. E. Briggs, auditor of coal and coke accounts on the New York Central, with headquarters at New York, has retired under the pension regulations after 44 years of continuous service with that company. **E. F. Haubold,** auditor of freight accounts, with headquarters at Cleveland, O., will replace Mr. Briggs as auditor of coal and coke accounts at New York. He will in turn be succeeded as auditor of freight accounts by **T. W. Meyer,** general rate accountant at Cleveland. These appointments became effective August 1.

Operating

F. J. Gavin, general superintendent of the Lake and Eastern districts of the Great Northern, with headquarters at Duluth, Minn., has been promoted to assistant general manager, with headquarters at St. Paul, Minn. **W. R. Smith,** general superintendent of the Central and Western districts, with headquarters at Great Falls, Mont., has been promoted to assistant general manager, with headquarters at the same point, succeeding **F. S. Elliott,** who resigned on August 1 because of ill health. Mr. Elliott's headquarters were at Seattle, Wash.

W. R. Brown, assistant to the president and general manager of the Muscle Shoals, Birmingham & Pensacola, with headquarters at Pensacola, Fla., has been appointed superintendent of the Western division of the St. Louis-San Francisco, with headquarters at Enid, Okla., following the taking over of the M. S., B. & P. by the Frisco on August 1 for operation between Magnolia, Ala., and Pensacola, Fla., as the Pensacola Pacific Railway for June this year Brown succeeds **S. J. Frazier,** who has been transferred to the Southern division, with headquarters at Memphis, Tenn., to replace **R. B. Butler,** who resigned on July 31.

Traffic

P. E. Gross, general agent in the freight traffic department of the Nashville, Chattanooga & St. Louis at Savannah, Ga., has been promoted to general eastern agent, with headquarters at New York, a newly created position, effective August 1.

G. R. Webster, assistant general agent on the Chicago, Milwaukee, St. Paul & Pacific at Seattle, Wash., has been promoted to general agent at Portland, Ore. **Roy Jackson,** traveling freight and passenger agent at Seattle, has been promoted to succeed Mr. Webster.

L. H. Mussman, general agent on the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Chicago, Ill., has been appointed division freight agent, with headquarters at Columbus, O., succeeding **W. G. Pennell,** deceased. **A. F. Haverkamp** has been appointed general agent at Chicago, succeeding Mr. Mussman.

John C. Patteson, assistant general agent, steamship department of the Canadian Pacific, with headquarters at New York, has been appointed general agent of the passenger department, covering both the railway and the steamships, with headquarters at Philadelphia, Pa. **J. Black Mackay,** assistant general agent, steamship passenger department, has been appointed general agent of that department, with headquarters at Toronto, Ont., succeeding **J. Ernest Parker,** who has resigned to enter business for himself in Montreal.

C. L. Netherland, who has been promoted to general freight agent of the Illinois Central, with headquarters at Memphis, Tenn., entered railway service on September 1, 1902, on that rail-

C. L. Netherland

road. Early in 1906 he became chief clerk in the commercial office of the Illinois Central at Cincinnati, Ohio, being appointed contracting freight agent at the same point later in 1906. From April 15, 1913, to January 11, 1926, Mr. Netherland served successively as traveling freight agent at Ft. Dodge, Iowa, and St. Louis, Mo., as assistant commercial agent at Chicago, as commercial agent at Evansville, Ind., as traffic service agent at Chicago and as commercial agent at Minneapolis, Minn. He was then promoted to assistant general freight agent, with headquarters at Memphis. His promotion to general freight agent became effective on July 16.

Andrew S. Jennings who has been appointed coal freight agent on the Pennsylvania, with headquarters at Pittsburgh, Pa., was born on June 12, 1894, at Bellaire, O. He was graduated from the Bellaire High School in May, 1912, and entered the service of the Pennsylvania the same year as a clerk in the freight office at Bellaire, where he served in various capacities until November, 1916, at which time he was transferred to the position of clerk in

Andrew S. Jennings

the trainmaster's office at Cleveland, also assisting the car distributor. In February, 1917, he was assigned to special work on the Akron division, remaining in that capacity until May of the same year when he returned to the Cleveland division, as extra clerk under the assistant trainmaster. Mr. Jennings was in military service from May, 1918, until August, 1919, at which time he returned to the Pennsylvania as extra agent. In April, 1920, he was transferred to the freight traffic department as chief rate clerk and in August of that year he was promoted to freight representative at Wheeling, W. Va. He was transferred in the same capacity to Cleveland in February, 1922, and two years later he became chief clerk to the division freight agent at Wheeling, later returning to Cleveland as chief clerk to the coal and ore agent. In November, 1927, Mr. Jennings was appointed district freight agent at Cleveland and he served in that capacity until July, 1928, when he was appointed to his present position as coal freight agent.

Engineering, Maintenance of Way and Signaling

W. H. Stillwell, acting signal engineer of the Louisville & Nashville, with headquarters at Louisville, Ky., has been promoted to signal engineer, with headquarters at the same point.

J. C. Patterson, superintendent of maintenance on the Erie, with headquarters at New York, has been appointed chief engineer of maintenance of way, with the same headquarters.

P. M. Gault, signal engineer of the Missouri Pacific, with headquarters at St. Louis, Mo., has also been appointed signal engineer of the International-Great Northern and the Gulf Coast Lines, newly created positions.

T. C. Seifert, office engineer of the signal department of the Chicago, Burlington & Quincy at Chicago, has been promoted to assistant signal engineer, with headquarters at the same point, succeeding **B. W. Lollis,** who resigned on July 15 to engage in other business.

D. E. Gelwix, division engineer of the Northern division of the St. Louis-San Francisco, with headquarters at Fort Scott, Kan., has been promoted to maintenance assistant to the general manager, with headquarters at Springfield, Mo. **J. O. Armstrong,** assistant division engineer of the Northern division at Fort Scott, has been promoted to division engineer of that division, succeeding Mr. Gelwix. **B. H. Crosland,** terminal roadmaster at Kansas City, Mo., has been promoted to assistant division engineer of the Northern division to replace Mr. Armstrong. **G. W. Koontz,** division engineer of the River division, with headquarters at Chaffee, Mo., has been transferred to the Southern division, with headquarters at Memphis, Tenn., succeeding **J. H. Brooking,** who resigned on July 31. **E. L. Brand,** assistant engineer on the River division at Chaffee, has been promoted to division engineer of that division to replace Mr. Koontz.

Mechanical

J. W. Burnett, master mechanic of the Wyoming division of the Union Pacific, with headquarters at Cheyenne, Wyo., has been promoted to assistant superintendent of motive power, with headquarters at Omaha, Neb. **John Gogerty,** master mechanic of the Western division, with headquarters at Green River, Wyo., has been transferred to the Wyoming division to succeed Mr. Burnett.

J. W. Highleyman, assistant superintendent of motive power and machinery of the Union Pacific, with headquarters at Omaha, Neb., has been promoted to superintendent of motive power and machinery of the Oregon Short Line, with headquarters at Pocatello, Idaho, succeeding **A. C. Hinckley,** who retired from active railroad service on August 1. Mr. Hinckley was born in 1863 in New York and received his education at Meads College, entering railway service in 1885 as a machinist apprentice on the Chicago, Pekin & Southwestern (now part of the Atchison, Topeka & Santa Fe). Later he was advanced to machinist on that railroad and in 1891 he became a locomotive engineman on the Chicago, Burlington & Quincy. From 1895 to 1900 Mr. Hinckley served as master mechanic of the St. Joseph & Grand Island at St. Joseph, Mo., and he was then appointed road foreman of engines and later master mechanic of the Utah Central (now part of the Denver & Rio Grande Western). He became master mechanic of the Denver & Rio Grande at Salida, Colo., in 1904 and in 1907 he was appointed master mechanic of the Cincinnati, Hamilton & Dayton (now part of the Baltimore & Ohio) at Lima, Ohio, where he remained until January, 1910, when he was appointed assistant master mechanic on the Southern Pacific at West Oakland, Cal. Later in the same year he was promoted to master mechanic at that point and in May, 1914, he was appointed superintendent of motive power and machinery of the Oregon Short Line.

Obituary

Alonzo F. Bowles, superintendent of the San Joaquin division of the Southern Pacific, who died at San Francisco, Cal., on June 10, had been in the service of that company for nearly 41 years. He was born at Dexter, Ohio, on November 8, 1867, and entered railway service as a freight brakeman at Los Angeles, Cal., in December, 1887. Five years later Mr. Bowles was advanced to conductor, serving in that capacity until July, 1907, when he was promoted to trainmaster of the San Joaquin division. In the same year he was again promoted to assistant superintendent of the Tucson division, being transferred to the Sacramento division in 1908 and to the Los Angeles division in 1909. Mr. Bowles remained as assistant superintendent of the Los Angeles division until July 1, 1925, when he was promoted to superintendent of the San Joaquin division, with headquarters at Bakersfield, Cal.

John Hayes Reagan, superintendent of track of the Grand Trunk Western who died at Battle Creek, Mich., on July 16, had been in railroad service for more than 60 years. He was born on May 4, 1855, at Danville, Pa., and entered railway service on July 1, 1868, at the age of 13 years as a water boy on the Philadelphia & Reading (now the Reading) at Gerard, Pa. The following year Mr. Reagan became a section laborer on the Reading at Catawissa, Pa., and at the age of 18 years he became a section foreman on the Delaware, Lackawanna & Western at Nanticoke, Pa. On March 25, 1878, he entered the service of the Wabash as a section foreman at Moberly, Mo., and two years later he was appointed extra gang foreman at the same point. In 1887 Mr. Reagan was promoted to roadmaster at Moberly, being appointed to a similar position on the Chicago & Alton at Springfield, Ill., in 1893. He entered the Grand Trunk service on July 1, 1897, as general roadmaster, with headquarters at Battle Creek, and on February 15, 1893, he was promoted to superintendent of track, with headquarters at Detroit, Mich. As superintendent of track his headquarters were for a short time at Chicago. Mr. Reagan had been head of the track maintenance department of the Grand Trunk and the Grand Trunk Western for 31 years.

Job A. Edson, who retired on January 1 from active railway service as president of the Kansas City Southern, died at Long Beach, Cal., on July 30 at the age of 74 years. Since his retirement, Mr. Edson had retained a connection with the company under the title of president retired. A review of his railway career and his work as president of the Kansas City Southern appeared in *Railway Age* of December 31, 1927, page 1327. Mr. Edson was born on February 14, 1854, at Sylvania, Ohio,

Job A. Edson

and entered railway service at 13 years of age as a telegraph operator on the Lake Shore & Michigan Southern (now part of the New York Central). In 1872 he became telegraph operator on the Union Pacific, becoming successively train dispatcher and trainmaster. In 1886 Mr. Edson was appointed chief dispatcher of the Iowa and Dakota division of the Chicago, Milwaukee & St. Paul (now the Chicago, Milwaukee, St. Paul & Pacific). In 1887 he became a division superintendent on the Missouri Pacific and in 1889 became superintendent of the Texas division of the St. Louis Southwestern, where he remained until July, 1892, when he was promoted to the position of superintendent of the entire system. The following year Mr. Edson was elected general superintendent and second vice-president of the St. Louis Southwestern of Texas and general superintendent of the Cotton Belt and its subsidiary, the Tyler Southeastern. Mr. Edson was general manager of the Kansas City, Pittsburg & Gulf and its successor, the K. C. S., from June 25, 1899, until January 1, 1903, and then became manager of the Denver & Rio Grande. He became general manager of the Cincinnati, Hamilton & Dayton on October 15, 1904, and remained with that road until he returned to the K. C. S. as president on June 1, 1905. During the period of federal control, Mr. Edson served as federal manager of his own railroad, the Kansas City, Mexico & Orient, the Missouri & North Arkansas and the Midland Valley and for a portion of that time as federal manager also of the Houston, East & West Texas (now part of the Southern Pacific) and the Vicksburg, Shreveport & Pacific.